SAN FRANCISCO DEPARTMENT OF CITY PLANNING 100 LARKIN STREET · SAN FRANCISCO, CALIFORNIA 94102

DRAFT
ENVIRONMENTAL IMPACT REPORT

595 MARKET STREET

Review Period: Nov. 14 to Dec. 18, 1975

San Francisco, California

SUMMARY

This report describes a proposed office building which would contain retail space at the ground level and general offices above, the tenants for which are as yet unspecified. The building would house approximately 2,600 office and commercial workers.

The proposed building would be located at the S.E. corner of Market and Second Streets in San Francisco and would occupy a rectangular site; the site measures 190 ft. along Market Street and 155 ft. along Second Street. The building would consist of a two-story base element, 27 stories of office space, and additional mechanical space for a total height of about 402 feet measured at the Market and Second Street property lines. Above 50 feet the design of the proposed structure would be a six-sided lozenge shape in plan with the long face at an angle to the Market and Second Streets intersection. This face would be at right angles to Post Street and would form the visual termination to Post Street when viewed from the west. The proposed design requires a Conditional Use Authorization for deviation from the bulk limits of the Planning Code.

Effects upon the environment include temporary and permanent impacts. Among the temporary impacts are construction noises, including pile driving operations, traffic interruptions and associated vehicular air pollution. Among the permanent impacts are increased demands on energy sources and utilities, increased demands on the public transportation serving the area, increase in automobiles in the downtown core area, increased sidewalk congestion and impact on other public and private services.

Alternatives to the proposed project include other designs, such as a square cross-section for the entire height, a

a structure taller than the proposed 402 feet, and rotation of the structure 45 degrees (tower face parallel to Market Street). Alternative use considerations discussed are a structure containing no ground floor retail space, a structure containing a mix of housing and commercial space, and retaining the present structures on the site (No Project).

Mitigation measures proposed include design measures to minimize energy consumption, control of construction truck traffic, control of airborne dust from construction activities and measures to reduce sound from pile driving operations. Two alternative designs were wind tunnel tested to examine possible mitigation measures to the wind patterns created by a new structure on the site: 1) a structure of similar height with a rectangular shape and 2) a structure similar to that proposed but rotated 45 degrees. In both cases, winds along Market Street were found to be higher than with the proposed design.

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

LIST OF TABLES

Architect's Concept of Proposed Project

Figure I

I. PROJECT DESCRIPTION

A. Location and Boundaries

The site of the proposed project is located in the area generally referred to as the Market Street Corridor in the Central Business District (CBD). The property consists of Lots 41, 42, 43 and 44 in Assessors' Block 3708, and is bounded by Market Street on the north, Second Street on the west, Stevenson Street on the south and First Street on the east. All four lots of the site are presently occupied by structures. Refer to Figures 2, Page 3, and 3, Page 6 for a graphic presentation of the location and boundaries of the site of the proposed project. Refer to Figure 4, Page 7 for the survey of the site showing the four lots and their respective present structures.

B. Owner of the Proposed Project

Real Property West No. Two, Inc. is a California Corporation which is a wholly-owned subsidiary of Western Properties, S.A., the shareholders of which are five public-held institutions located in the United Kingdom.

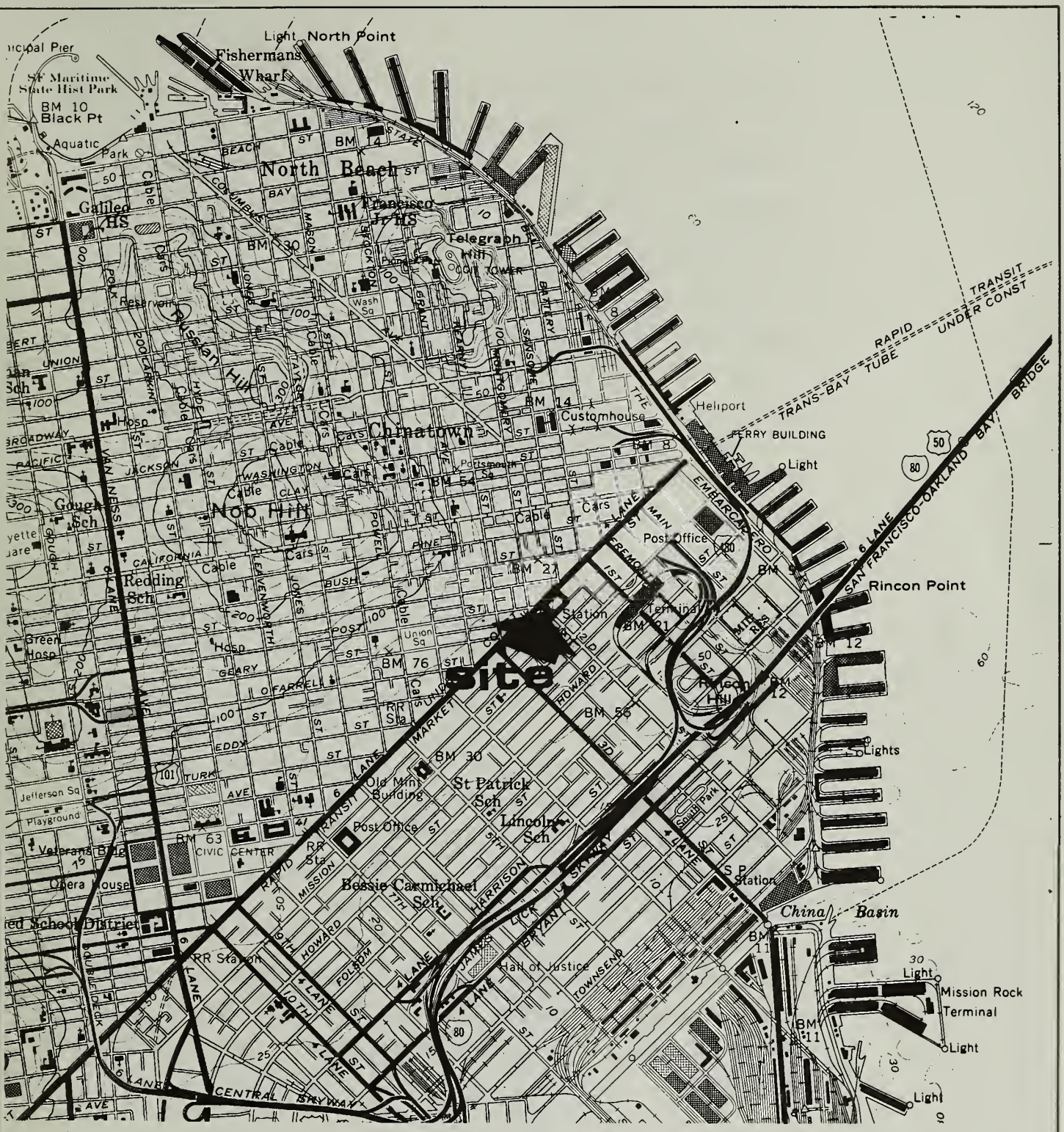
C. Objectives Sought by the Proposed Project

The project sponsor wishes to construct a commercial development which would maximize the return on the investment of the property.

D. Description of the Proposed Project

1. Type of Project

The project sponsor proposes to construct a building of approximately 402 feet in a C-3-0 (Downtown Office) District which has a 700 foot height limit. The



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1 0 1 MILE

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N

SAN FRANCISCO NORTH, CALIF.

N3745—W12222.5/7.5

LOCATION MAP

Figure 2

Planning Code states that this C-3-0 zoning district has a maximum allowable floor area of 14.0 times the area of the lot, excluding either development bonuses or (but not both) a 20% corner lot premium.* The proposed project's floor area of 462,000 square feet for the proposed structure, plus 23,250 square feet for the structure on Lot 44 (Stacey's Bookstore), which would remain, would result in a floor area ratio (F.A.R.) of 16.5. Thus either a corner lot premium or a development bonus must be utilized to obtain approval for subject building. With the corner lot option exercised, the effective permitted floor area ratio becomes 16.8. Table 1 illustrates the relationship between F.A.R. and lot size for this proposed project. For comparison, the Wells Fargo building, located nearby at the southeast corner of Sutter and Montgomery Streets, is shown.

The proposed building would be positioned so as to visually define the foot of Post Street at the Market Street intersection. The broadest face of the hexagonally shaped structure would be oriented towards Post Street. Refer to Figure 5, Page 8, for the site plan which depicts the relationship of the proposed structure to the surrounding street system.

The building, if constructed, would deviate from the Bulk Limits of the San Francisco Planning Code which govern horizontal dimensions of the building

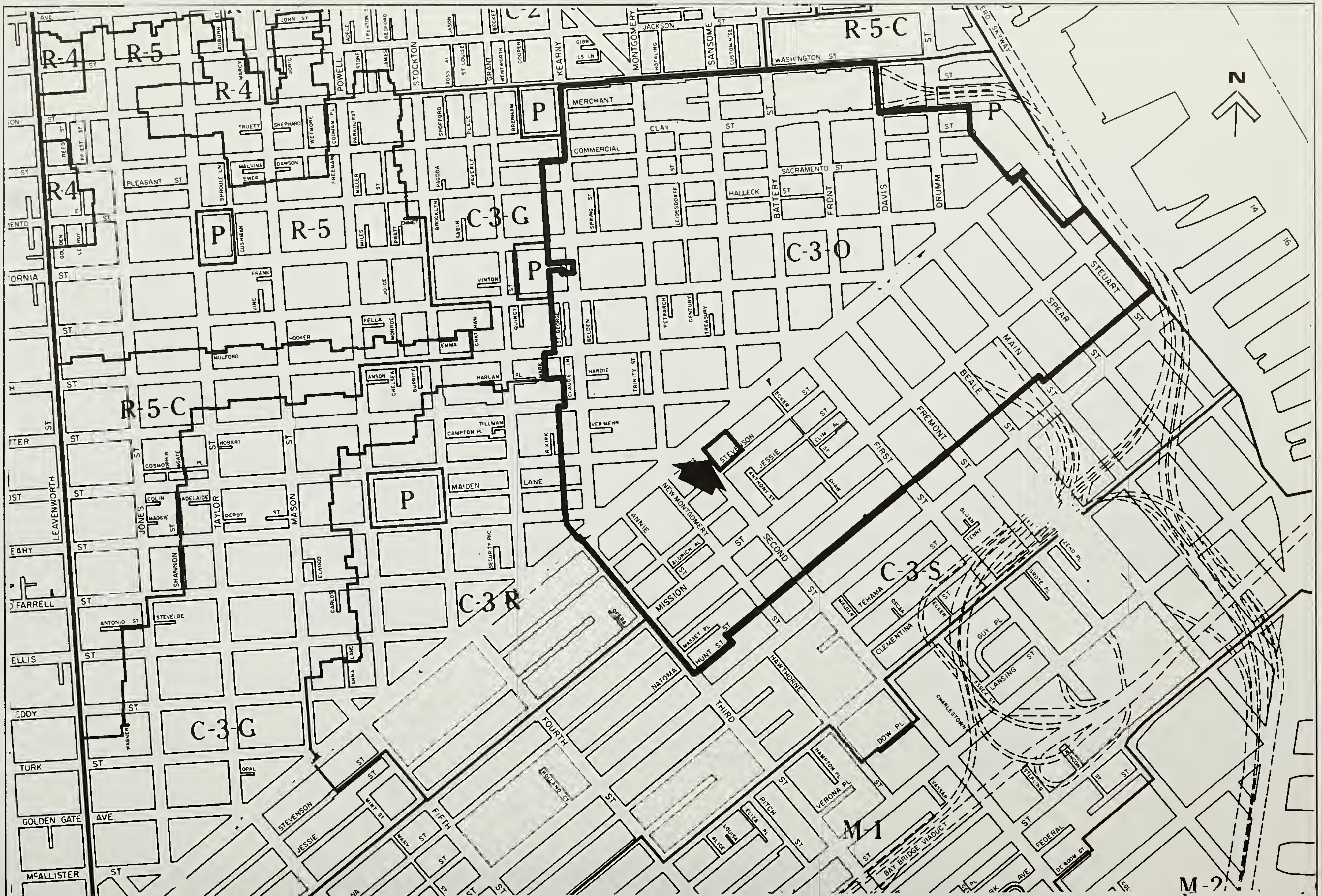
* Sec. 122.3 City Planning Code: Floor area ratio (F.A.R.) is a ratio of the total gross floor area in a building to the land area occupied by the building. The bonuses are added to the basic floor area ratio to determine the maximum to which the property may be developed. A corner lot premium may be added in lieu of specific development bonuses.

TABLE 1

FLOOR AREA RATIO (F. A. R.)

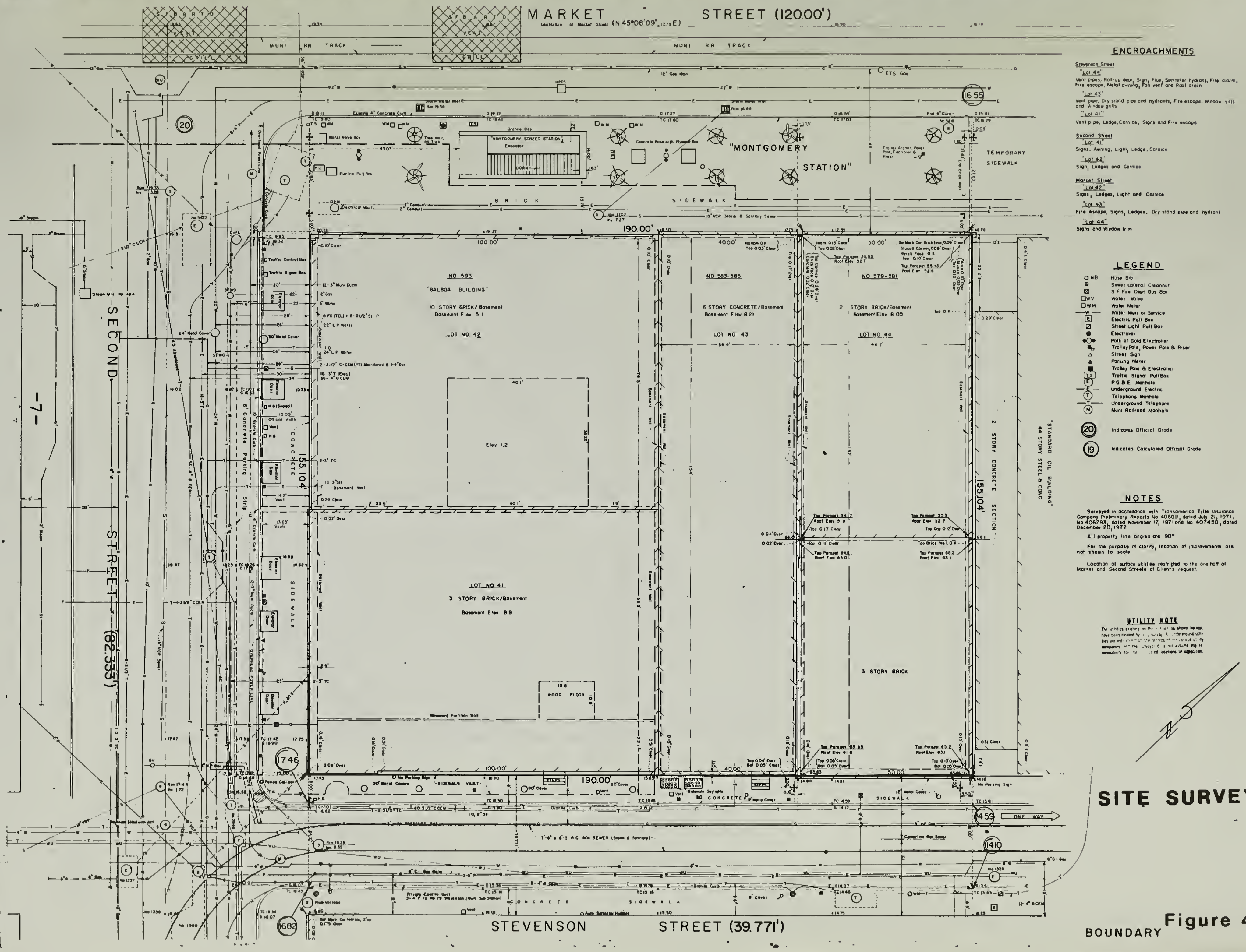
BUILDING	2ND & MARKET	WELLS-FARGO
Size of Site (sq.ft.)	29,450	30,025
Actual Gross Floor Area(sq.ft.)	450,943 *	717,000
Basic Allowable Gross Floor Area	412,566	None at time of construction (1966)
Basic Allowable Floor Area Ratio Area (without Bonuses)(sq.ft.)	14:1	" " "
Actual Floor Ratio of Building	15.3:1	23.9:1

* Includes 23,250 sq.ft. for Stacey's Bookstore

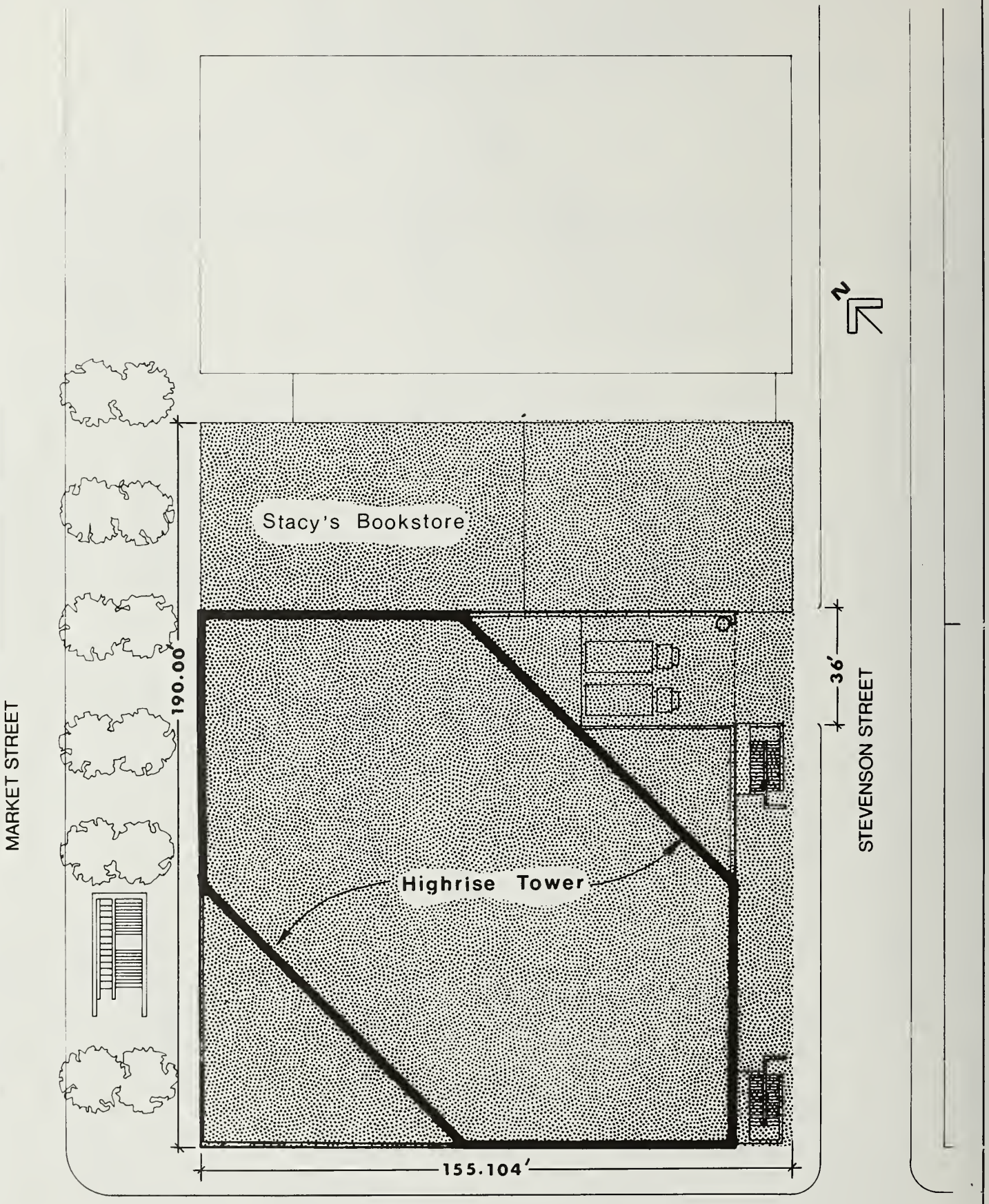


VICINITY MAP

Figure 3



BOUNDARY SITE SURVEY Figure 4



SITE PLAN

Figure 5

for this zoning district. This subject is discussed on Page 10 of this report.

2. Design Considerations

The proposed hexagonal design deviates from the typical South-of-Market high-rise design which is rectilinear. Refer to Section III.F., Land Use, Page 46, and Section III. L., Visual Impacts, Page 68, for a discussion of the appropriateness of the proposed design for the subject site.

LENGTH

At ground level, the proposed structure would extend 140 feet each along both the Market and Second Street frontages. Above 50 feet, the faces flush with the street frontages are each 72'-2½". Refer to Ground Floor Plan, Figure 6, Page 11.

HEIGHT

The total height of the proposed structure, to the top of the finished roof, would be 402'-3". In addition, a penthouse containing mechanical equipment for the operation of the building would be 14 feet in height. Refer to Building Elevations, Figure 7, Page 12.

ENTRANCES

There would be three entrances for the retail space located on the first, second and mezzanine floors: two off Market Street and one off Second Street. The main building entrances for the upper 27 floors of office space would be located at the NE and SW corners of of the proposed structure, gained from the recessed corner plazas. Refer to Ground Floor Plan, Figure 6, for the location of these entrances.

If built, the proposed design would result in a deviation from that provision of the City's Bulk Limits which requires that portion of a building which exceeds 150 feet in height to have a length not exceeding 170 feet and a diagonal dimension not exceeding 200 feet. This deviation, which applies to Floors 8 through 27, would come about because these floors would have a length of 200 feet (30 feet in excess) and these dimensions would extend up to 402 feet above grade. Therefore, the upper 252 feet would deviate from the Bulk Limit Code requirement. Real Property West No. Two, Inc. has filed a Conditional Use permit application covering this condition. Refer to Figure 8, Page 13, Typical High Rise Plan, for an illustration of the dimension which would be in excess of the Bulk Limit requirement.

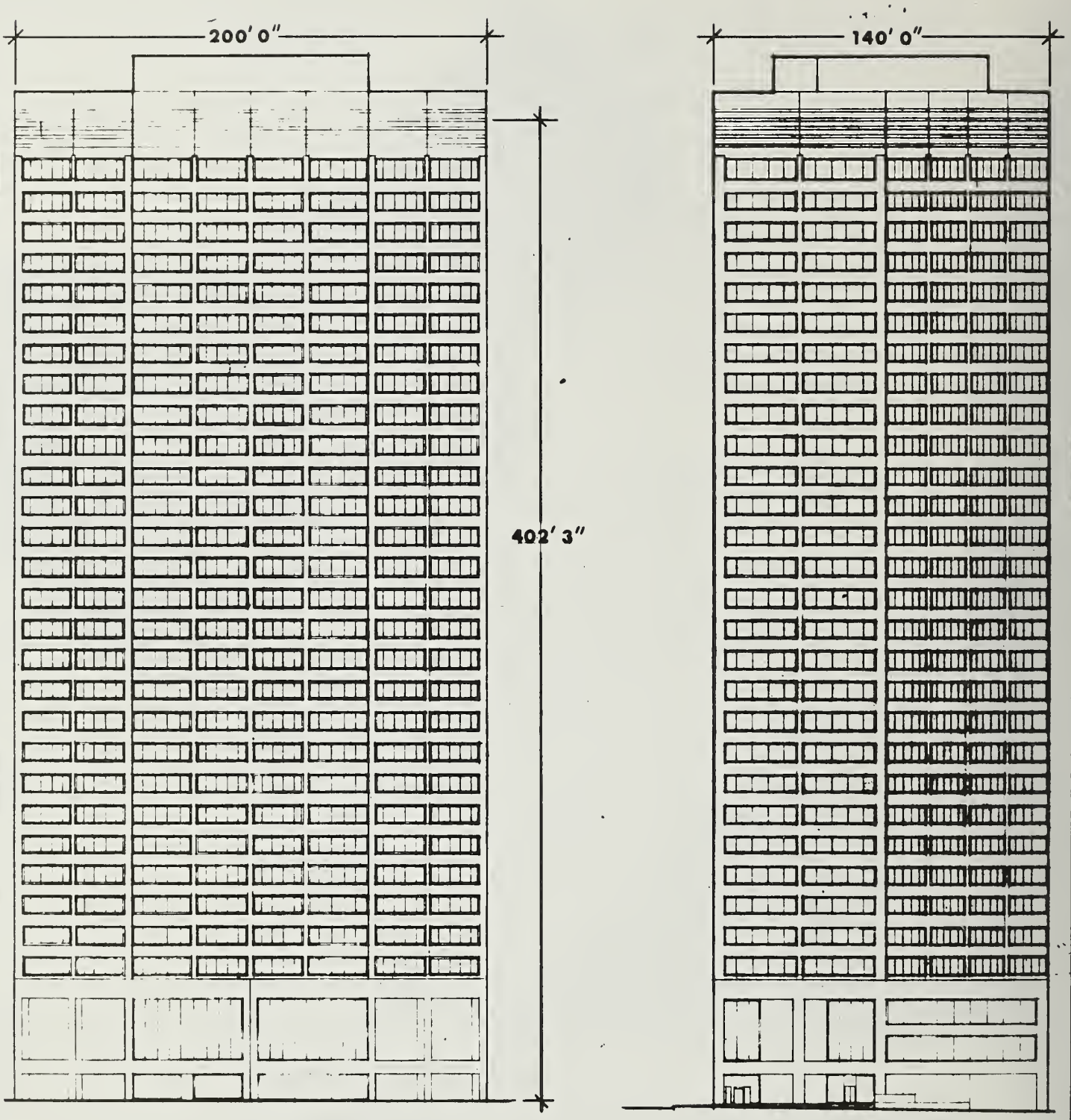
3. Building Construction

Type 1 construction* throughout is planned for the proposed building. This includes a structural steel

* Definition. A Type 1 building is defined as having the structural elements of reinforced concrete, reinforced grouted masonry, reinforced hollow concrete unit masonry or steel; and the exterior walls, the inner court walls, the walls enclosing vertical openings, the roofs and floors of fire-resistive incombustible construction.

GROUND FLOOR PLAN

Figure 6

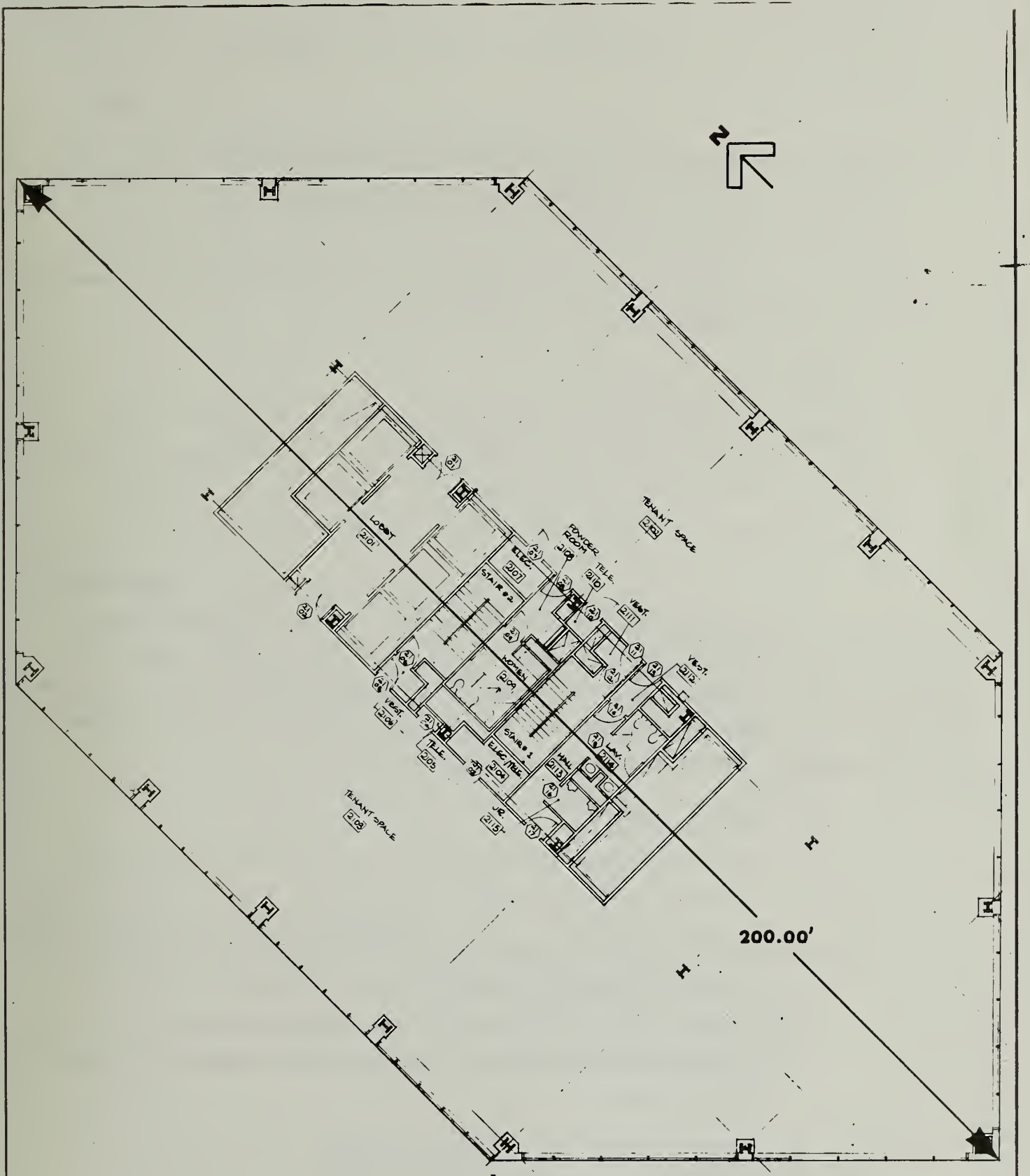


NORTH-WEST ELEVATION
(MARKET & SECOND)

ELEVATIONS

SOUTH ELEVATION
(STEVENSON STREET)

Figure 7



TYPICAL HIGH RISE PLAN

Figure 8

frame with a honeycomb-like cellular metal deck, with reinforced concrete foundation walls and lower floors. Exterior materials would be light in color (to be selected) with untinted glass area at the first and second floors (see page 12) to provide an open atmosphere viewed from the street level.

4. Office Space

Approximately 378,000 square feet of office space would occupy the 27 floors above the mezzanine level. These upper floors would be supported at the perimeter of the building and at the central core (containing stairs, elevators and toilets) to provide a clear span between perimeter and core for the future arrangement of office space. All utilities, such as power, telephone and communication systems, would be contained in an underfloor duct system. At the present time there are no specified tenants for the proposed office space.

5. Retail Space

Approximately 20,000 square feet of retail space is planned for the ground, and second floors, of the proposed building. It is envisioned that this space would be occupied by shops/commercial tenants, such as restaurant, apparel and drug establishments at the ground floor, and a bank at the second floor. At the present time there are no specified tenants for the retail space.

6. Service

The proposed building plans include a two-stall truck dock off Stevenson Street, to the rear of the site, as required under Sections 135(E) and 139 of the Planning Code.

Building maintenance facilities would be distributed throughout the proposed structure.

7. Mechanical and Electrical Systems

The proposed building would be provided with a full air conditioning system including heating, cooling, and mechanical ventilation of all spaces except at basement level, which would be provided with mechanical ventilation only. All normal utilities including gas, water, electrical power, telephone and City sewers would be required by the proposed building and its population and would be connected through underground ducts, piping and vaults. Refer to the Mitigation Section of this report, Page 73, for the features of the mechanical and electrical systems which take into consideration the conservation of energy.

8. Transportation Systems

The location of the project and the existing streets which serve the project are shown in Figures 13, page 31 and 15, page 36. There are to be no parking spaces provided within the proposed building. The sidewalk on the north side of Stevenson Street would be cut by a 36-foot curbcut to allow access to and from the site by service vehicles. (see Figure 4, page 8)

9. Fire Protection

The proposed building would comply with the 1973 Life Safety Program for High Rise Buildings of the San Francisco Building Code. Among the components of this section of the Code are:

a. Central Control Station - provides a central location for Fire Department fire fighting operations and control.

b. Standby Power and Light - provides power source for electrical equipment such as the fire alarm system, exit and emergency lighting, and some elevators, when normal power is interrupted.

c. Communication System - provides two-way communication by the Fire Department at designated points on each floor. The system would be carried in fire-resistive shafts.

d. Elevator Safety Provisions - provides that every floor be accessible from the main level of Fire Department access by at least 1 elevator.

e. Fire Sprinkler System - provides automatic sprinkling throughout the building.

f. Smoke Control System - prevents transfer of smoke and other products of combustion vertically to any other portion of the building.

9. Project Statistics

	Proposed Project
Land Area	29,450 sq.ft.
Gross Floor Area	
a. New Structure	
Ground Floor	7,165 sq. ft.
Second	12,878
Third	2,650
Office Towers	405,000
	427,693 sq. ft.
b. Stacey's Bookstore* Building	23,250
	450,943 sq. ft.
Land in Open Space	1,601 sq. ft.

Population (estimated)

Day	2,615
Night	50
	2,665

(Cont'd. Page 17)

* Stacey's Bookstore lease expires in 1976; an option for a further 10 year extension is available.

	Proposed	Planning Code Limits
Building Dimensions		
Maximum height above grade	402 ft.	700 ft. *
Maximum length	200 ft.	170 ft. **
Maximum diagonal	200 ft.	200 ft.
Off Street Parking		
a. Autos	0	0
b. Service Vehicles	2	2
Gross Floor Area		
New Structure	450,945 ft.^{2}	466,550 ft.^{2}***
Construction Cost (Fall '75)		$22,000,000

E. Project Phasing and Scheduling

Mr. Clifton C. Brinkley, construction consultant for this proposed project, has outlined the following phasing and scheduling which is scheduled to begin in Spring 1976 as soon as the necessary permits are obtained:

Demolition	1.5 months
Excavation	2.0
Foundation	2.5
Framing	3.0
Finish and Detailing	13.0
Total	24.0 months

* The maximum allowable height permitted by the City Planning Code is 700 feet plus 4 feet for parapets and 16 feet for penthouse. The proposed building would have a 26 foot high penthouse.

** The Bulk Limits established by the City for this bulk district provide that buildings shall not exceed 170 feet in length and 200 feet in diagonal dimension at heights exceeding 150 feet above grade. The proposed design exceeds these limits between the heights of 150 and 402 feet above grade. Real Property West No. Two, Inc. has filed a Conditional Use application covering this condition. (May 29, 1975)

*** Calculation made on the basis of utilizing 20% corner lot premium: [1.2 (125 ft. x 155 ft.) + (65 ft. x 155 ft.)] 14=466,550 sq. ft. For a further explanation of calculating allowable Gross Floor Area, see the "San Francisco Downtown Zoning Study," December 1966 on file at the San Francisco Public Library and the Department of City Planning.

II. ENVIRONMENTAL SETTING

A. Project Site

1. Existing Use

The site of the proposed project contains four separate buildings, three of which would be demolished for the proposed project. Table 2 shows the physical properties of the existing structures.

2. Topography and Geomorphology

The property is located close to the old Yerba Buena Cove shoreline. Prior to filling of the San Francisco Bay in the early 1850's, the area was covered with extensive wind-deposited sand dunes of variable heights. The upper portion of the dune sand was subsequently removed and used as fill material within the Bay to achieve the present shoreline in downtown San Francisco.[1] The present site elevation is approximately 24 feet above sea level.

A preliminary soils report has been prepared for the site by Harding-Lawson Associates, consulting engineers and geologists. This report consists of a review of the geologic and subsurface soil information for the vicinity of the site with supplemental data obtained by drilling one test boring at the site. Also included are data taken from laboratory testing. Refer to Figure 9, page 21, for the location of the test borings.

[1] Trask, P.D., and Rolston, J.W., 1951, Engineering Geology of San Francisco Bay, Calif.: Geol. Soc. America Bull., v. 62, no. 9, p. 1085.

Table 2 EXISTING STRUCTURES ON SITE

	581 Market	583-85 Market	593 Market	29 Second
Lot Number	44	43	42	41
Area of Lot	7,750sq.ft.	6,200sq.ft.	7,875sq.ft.	7,620sq.ft.
Height of Structure	35ft.	84ft.	118ft.	25ft.
Date of Construction	1913	1910	1906	1906
Type of Construction	Concrete	Brick and Rein-Con.	Brick and Rein-Con.	Brick
Gross Floor Area	10,975sq.ft.	36,960sq.ft.	78,500sq.ft.	21,900 sq.ft.
Present Use Include	Stacey's			
a. Ground Floor	Bookstore	Novelty-Ret.	Food, Photo Novelty Imp.	Food & Liquor Sales
b. Upper Stories	Health Spa	Credit Agency Public Service Organizations	Insurance Employment Agencies	Public Service Organization
Approximate Number of Employees	18 **	515*	970*	47 **
Condition of Existing Structures	Good	Good	Good	Good

* Based on 30 sq.ft per person for ground floor and retail, and 100 sq.ft. per person for offices from Table 33-A, San Francisco Building Code, pg. 332

** Actual count of employees.

Proposed future phases (after building permit is obtained) of the investigation will consist of:

1. Additional subsurface exploration, laboratory testing and engineering analysis.
2. Dynamic response analysis of the site soils.

The following soil conditions encountered in the test boring conducted by Harding-Lawson are summarized from their report.[1]

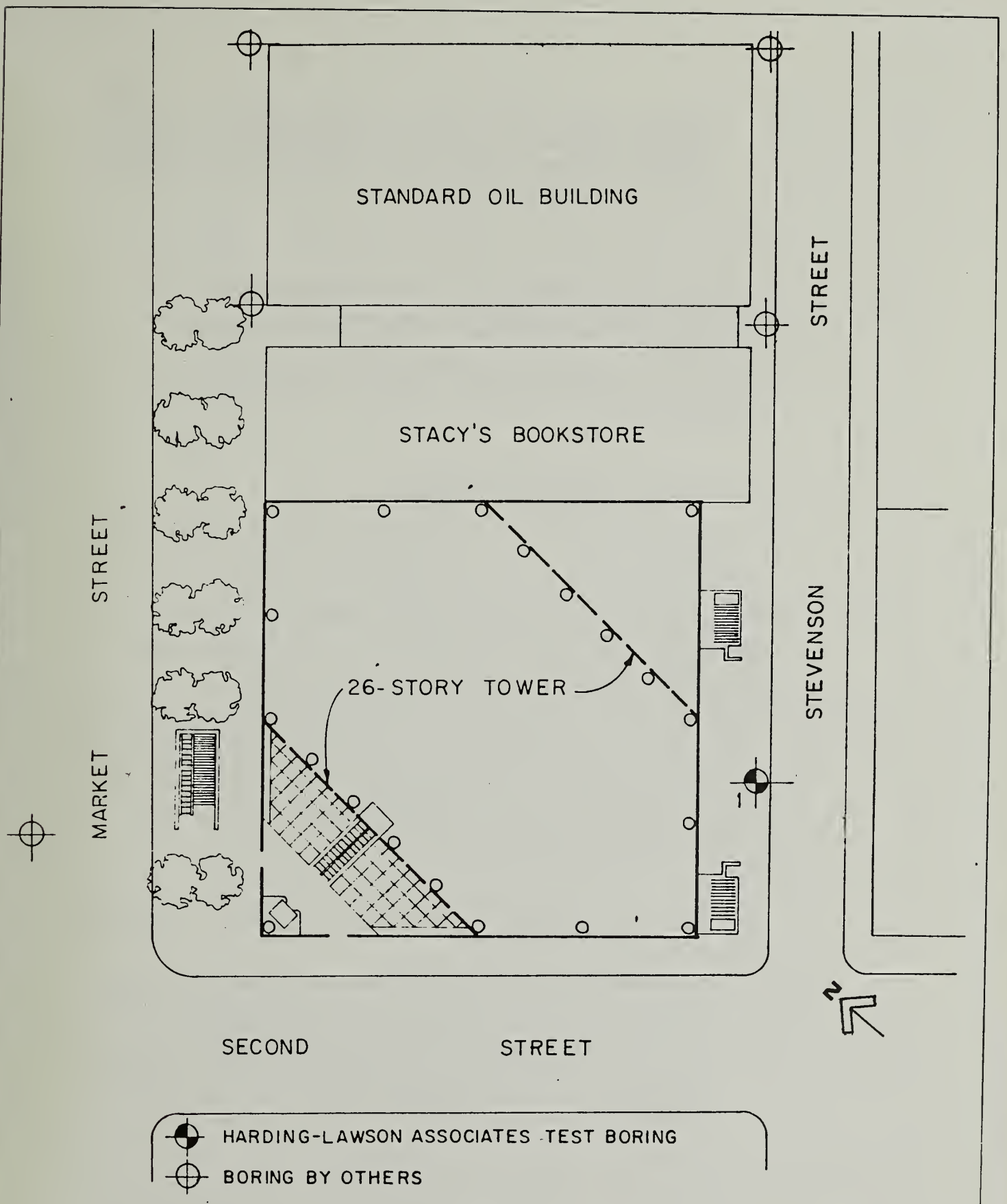
Fill and Dune Sand (0 to 27 feet) - Medium dense to dense with small amounts of debris; since the fill material consists of dune sand, it is difficult to differentiate between man-made fill and natural dune sand; below 20 feet, it appears to be natural dune sand deposits.

Soft Silts (27 to 41 feet) - Recent "bay mud" deposits which contain shells, organic matter and discontinuous pockets of fine dense sand. The silts and clays are low in strength and highly compressible.

Dense Sands and Stiff Clays (41 to 84 feet) - Posey formation consisting of interbedded sands, silts and clays; sands are dense to very dense, of high strength and low compressibility; clays and silts are of moderate strength and low compressibility.

Old Bay Silts and Clays (84 to 153 feet) - San Antonio formation consisting of stiff to very stiff silts and clays of moderate strength and moderate compressibilities. Much of the San Antonio formation in downtown San Francisco tends to be preconsolidated under loads higher than the presently existing overburden pressure; however, there can be zones of normally consolidated silts and clays which will further consolidate under new loads. The San Antonio also containes irregular and discontinuous lenses of dense sand.

[1] Preliminary Site Investigation, Proposed 26-Story Office Building, Harding-Lawson Associates, March 5, 1975, Page 4.



TEST BORING LOCATIONS

Figure 9

Dense Sands (153 feet to depth explored: 156 feet) - Alameda formation consisting of interbedded sands, silts and clays of high strength and low compressibility.

The boring did not encounter bedrock. Based on previous test borings in the area and published geologic data, bedrock is believed to be approximately 210 to 220 feet below street grade and to consist of sandstone and shale of the Franciscan formation.[1]

3. Historical and Scenic Aspects

The four buildings on the site are in a good state of repair.

The City's list of Designated Landmarks includes two landmarks in the vicinity: 130 Sutter Street (Hallidie Building) and the Garden Court of the Sheraton Palace Hotel.[2] Discussions with Ed Michael of the Planning Department staff have indicated there are no buildings on the site for which possible historic landmark status is being discussed by the City's Landmarks Board.[3]

From the soils report mentioned on Page 20, Harding-Lawson state:

> Because the site is located along the boundary of cut and fill within the dune sand (as indicated by the Geologic Map of San Francisco, North Quadrangle), we anticipate that very little debris or subsurface obstructions will be encountered in excavations below the existing building foundations.[4]

[1] Harding-Lawson Associates, March 5, 1975, Page 5

[2] Appendix A to Article 10, City Planning Code

[3] Telephone conversation with Mr. Edward Michael, 12/14/74

[4] Harding-Lawson, Page 3

It should be noted, however, that in October of 1969 human remains were encountered during excavations for the Civic Center BART Station at approximately 75 feet below Market Street's present surface.[1]

B. Surrounding Properties

1. Type of Land Use and Scale of Development

Nearby land fronting on Market Street is typically noted for its high-rise developments. (Refer to Photos pp. 71 - 72 .) Among these are the major structures listed in Tables 3 and 4, Page 28. Refer to Aerial View, Figure 10, Page 25, for the location of the structures mentioned in Tables 3 and 4. Many small businesses and shops can be found in the immediate area of the proposed site, particularly in older structures such as those presently occupying the site.

A small number of restaurants and bars are also located in the vicinity. Like the other small businesses, they are predominantly in older buildings. Also, Golden Gate University, a private school, is

[1] Phone conversation with Mr. Stephen Dietz of Archaeological Consulting and Research Services (ACRS), 8/5/75

located on Mission Street, between First and Second Streets; enrollment averages 4-5,000 students in day and evening classes. Existing building heights and uses on the site and adjacent areas are shown on Figures 11 and 12.

2. Cultural, Historical and Scenic Aspects

The Pacific Stock Exchange, 301 Pine Street at the southwest corner of Battery Street, is the only building in the area listed in Here Today.[1]

Mechanics Monument, located at Market, Battery and Bush Streets, was created in 1894 by Douglas Tilden (1860-1935). This bronze group depicts five workmen struggling to force by lever a mechanical punch through a metal plate. The sculpture was a gift of James Mervyn Donahue, son of the founder of San Francisco's first iron foundry, street railway, and gas company.[2]

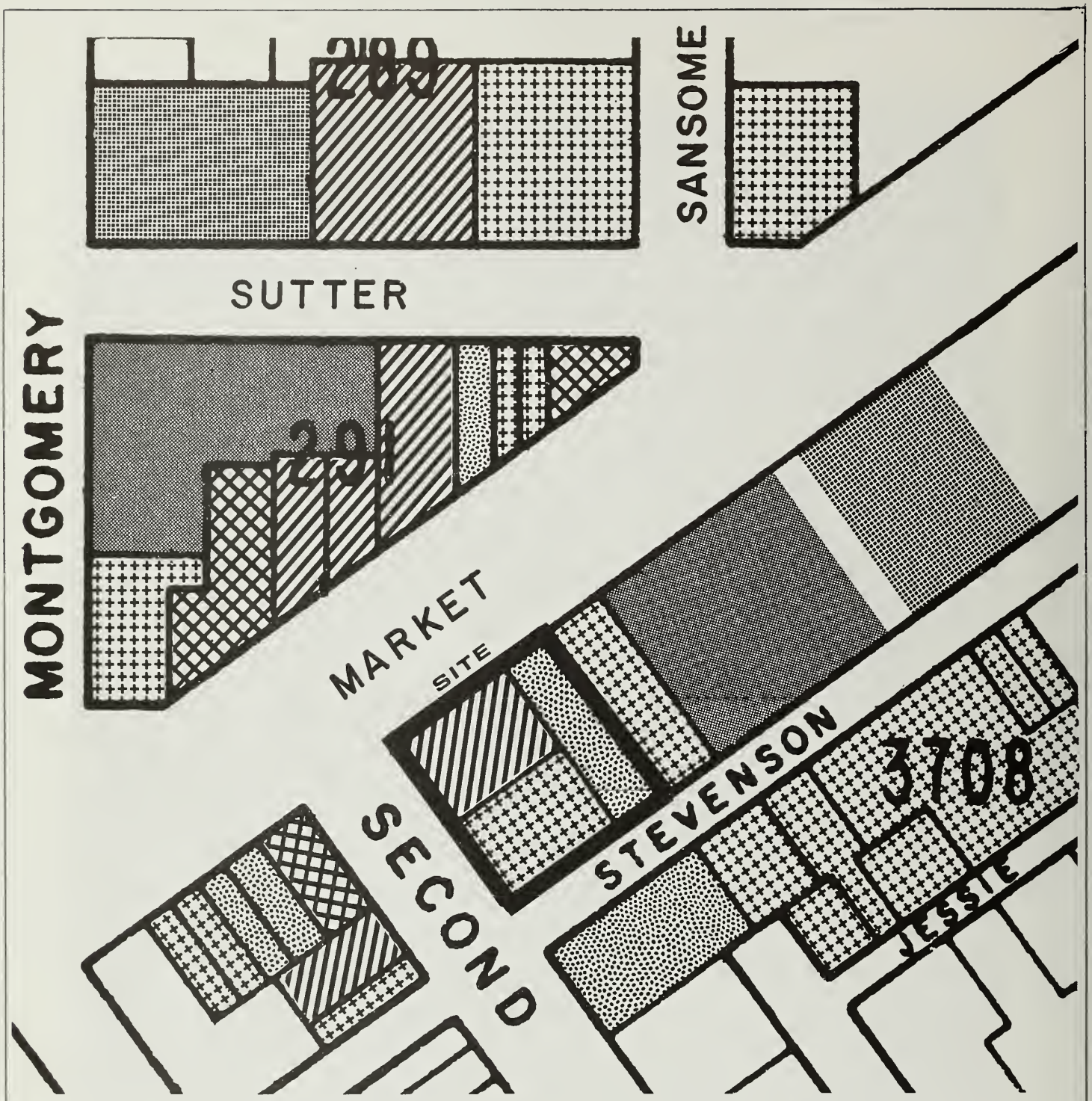
[1] Here Today, San Francisco's Architectural Heritage, Junior League of San Francisco, Chronicle Books, San Francisco, Calif., 1968

[2] Survey of Art Work, City & County of San Francisco, 1975

Proposed Structure

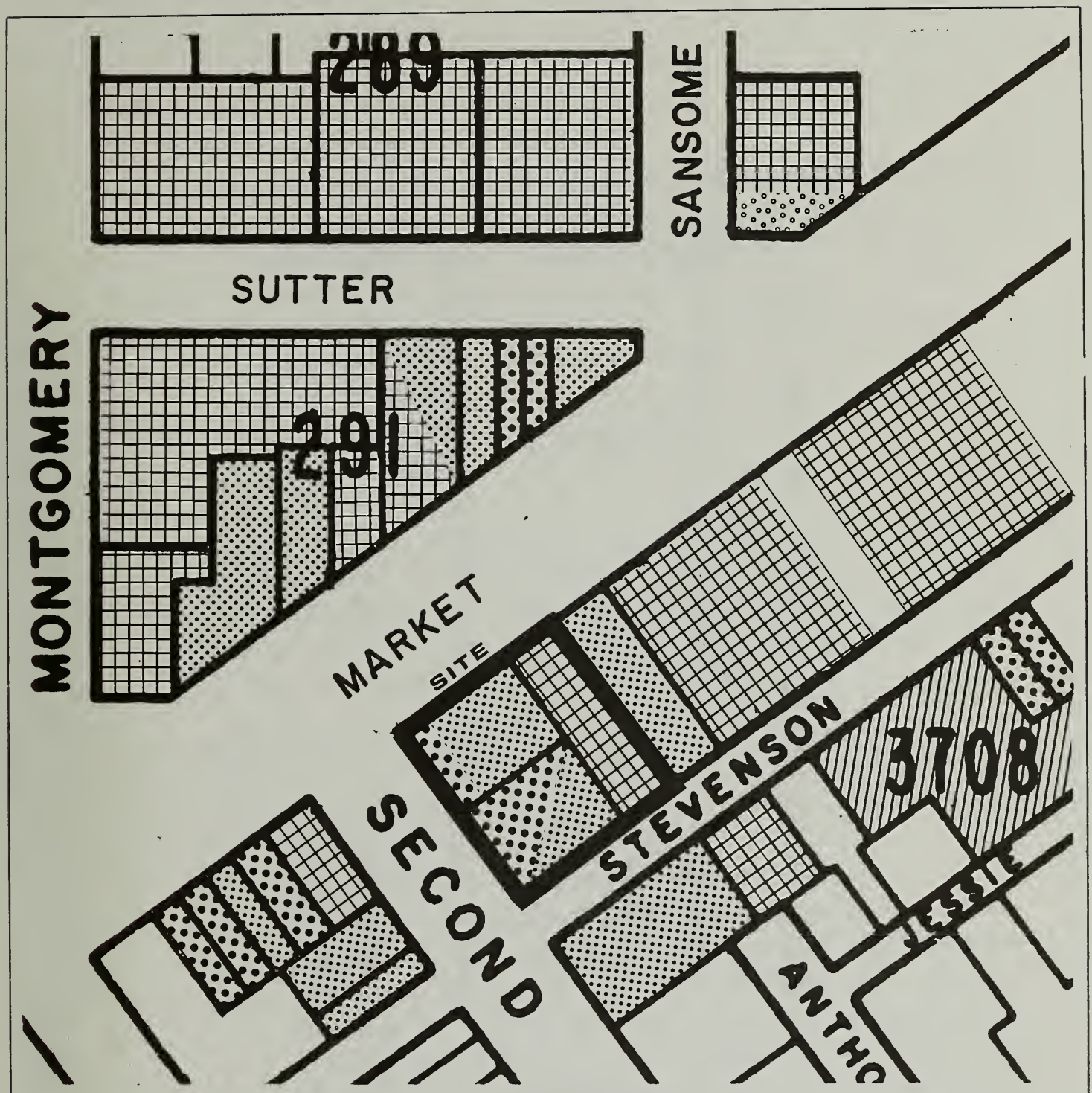
Aerial Photograph of Vicinity

Figure 10



EXISTING BUILDING HEIGHTS

Figure 11



GROUND FLOOR USES IN SITE AREA

Figure 12

Table 3 OFFICE BUILDINGS BUILT IN PROJECT AREA SINCE 1959

Completion Date	Building	Stories	Gross Floor Area (sq. ft. x 10^3)	Floor Area Ratio
1974	Tishman-Cahill	38	1,041	24:1
1964	Standard Oil-Chevron	22	283	7:1
1975	Standard Oil-Chevron	40	568	15:1
1966	Wells Fargo	43	717	24:1
1969	Bank of America	52	1,771	18:1
1969	Aetna Life	38	455	20:1

Table 4 OFFICE BUILDING PROJECTS IN CONSTRUCTION OR IN DESIGN

Estimated Comp. Date	Building	Stories	Gross Floor Area (sq. ft. x 10^3)	Floor Area Ratio
1977	444 Market	38	768	19:1
1976	Bechtel	34	1,670	13:1

At the intersection of Market, Kearny and Geary Streets, on a pedestrian island in the street right-of-way, lies "Lotta's Fountain." This elaborate public drinking fountain was formally presented to the City in 1875 to commemorate Lotta Crabtree, a well-known singer, dancer and comedienne of San Francisco in the 1860's. Lotta's Fountain has recently been placed on the National Register of Historic Places.

According to Ed Michael, Department of City Planning the nearest City designated landmarks are: 130 Sutter Street (Hallidie Building) and the Garden Court of the Sheraton Palace Hotel. Refer to Figure 22, Page 70, for the location of these landmarks.

C. Transportation Systems

1. Transit Service

San Francisco Municipal Railway (Muni)
16 bus and trolley lines provide service within one block of the site. (See Figure 13.) Patronage on these lines is shown on Table 5. Five streetcar lines now operate on Market Street and it is hoped that initial scheduling of some lines can begin operating in the new Muni subway under Market Street some time in 1976.*

* Phone conversation with Mr. Larry Sauve, Transit Planner, 9/3/75.

BART

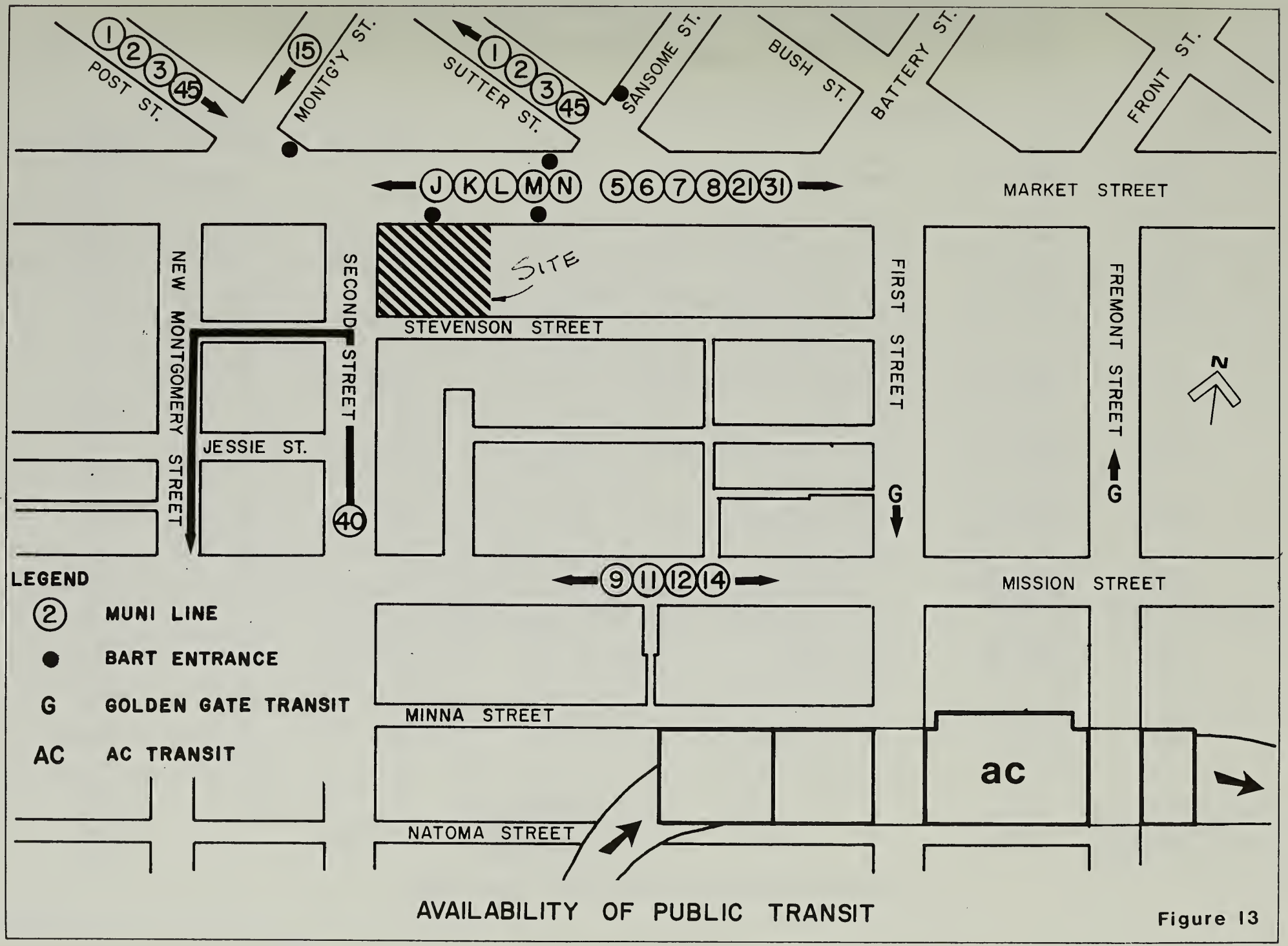
The project site is immediately adjacent to an entrance to the existing Montgomery Street station. (see Figure 13, page 31) Hours of operation currently are from 6:00 a.m. to 8:00 p.m. The institution of extended hours until midnight on weekdays is scheduled for November 28, 1975. Weekend service on the basic - "X"* routes is behind schedule; financial constraints on the system prevent the short-range implementation of this service.**

(3) Golden Gate Transit

The Financial District circuit of the Golden Gate Transit bus service to Marin County includes 24 lines which operate on Battery and First Streets for inbound buses and Fremont, Front and Sansome Streets for outbound buses. Bus stops are within one and two blocks of the site. Service is available from 6:30 a.m. to 11:30 p.m. with intensive service available during the morning and evening commute hours, approximately 7-9:00 a.m. and 4-6:00 p.m.

* Definition: Basic = "X" refers to the Concord-San Francisco/Richmond-Fremont pattern of the existing system.

** Observations of Board Director, James Hill (District 1), at Citizen Advisory Board meeting on July 9, 1975.



AVAILABILITY OF PUBLIC TRANSIT

Figure 13

TABLE 5

MUNI LINES' PATRONAGE DURING PEAK HOURS[1]

LINE	PERIOD[2]	RIDERSHIP AS PERCENTAGE OF SEATED CAPACITY
#1 California (1-3-75)*	AM Peak	105%
#2 Clement (7-12-74)	PM Peak	139%
#3 Jackson (11-14-74)	PM Peak	104%
#6 Masonic (4-26-72)	AM Peak	129%
(6-15-73	PM Peak	130%
#15 Third	---	less than 100%
#7 Haight (6-15-73)	PM Peak	125%
#8 Market (1-15-75)	PM Peak	146%
#9 Richland (4-18-74	AM Peak	110%
#11 Hoffman (2-26-74	AM Peak	130%
(2-26-74)	PM Peak	124%
#12 Mission-Ocean	AM Peak	105%
(4-18-74)	PM Peak	125%
(4-24-74)		
#14 Trolly Coach (Local)	AM Peak	106%
(4-18-74)	PM Peak	117%
(4-24-74)		
#14 Mission (Express)	AM Peak	113%
(10-24-74)	PM Peak	126%
(11-14-73)		
#14 Mission (Limited)	PM Peak	104%
(4-24-74)		
#14 Guerrero (Limited)	AM Peak	117%
(1-25-74)	PM Peak	109%
(12-4-73)		
#21 Hayes (11-12-74	AM Peak	102%
#31 Balboa (1-3-75)	AM Peak	102%
(11-4-74)	PM Peak	133%
#31 Balboa (Limited)	AM Peak	101%
(1-3-75)	PM Peak	132%
(11-4-74)		
#40 Commuter	---	less than 100%
#38 Geary (Local)	AM Peak	125%
(4-19-72)	PM Peak	125%
(10-22-74)		
#38 Geary (Express)	AM Peak	145%
(1-2-75)	PM Peak	143%
(10-22-74)		
#38 Geary (4-19-72)	AM Peak	129%
(10-22-74)	PM Peak	134%
#45 VanNess-Sutter	AM Peak	111%
(7-29-74)	PM Peak	153%
(9-20-73)		
J Church (10-9-74)	AM Peak	105%
(9-18-74)	PM Peak	130%
K Ingleside (10-9-74)	AM Peak	111%
(9-18-74)	PM Peak	107%
L Taraval (10-9-74)	AM Peak	139%
(9-18-74)	PM Peak	133%
M Oceanview (NOT AVAILABLE)		
N Judah (10-9-74)	AM Peak	141%
(9-18-74)	PM Peak	135%

* Date of Count.

1 Source: Muni, Planning Division, Mr. Larry Sauve.

2. AM Peak 7:30 - 8:30; PM Peak 4:30 - 5:30

AC Transit

AC Transit transbay service to Alameda and Contra Costa Counties is available three blocks from the project site at the Transbay Terminal at Mission and First Streets.

Greyhound

The Greyhound Contra Costa and Peninsula routes provide service to the Transbay Terminal and the 7th/Market Terminal. The Contra Costa service will be phased out when BART is fully operational.

Southern Pacific

SP commuter service to the Peninsula is provided at the depot located at Fourth and Townsend Streets. Access to the depot from the site is available via Muni, Route 40.

Transit Preferential Streets

The City's plan for transportation designates all streets adjacent to and most streets near the project (except alleys) as "transit preferential street."

Refer to figure 14, Page 35, for the location of nearby transit preferential streets.*

* Definition: Streets where certain treatments are provided to give priority to transit vehicles where conflicts with autos occur, and to decrease transit travel time.

(b) Vehicular Access

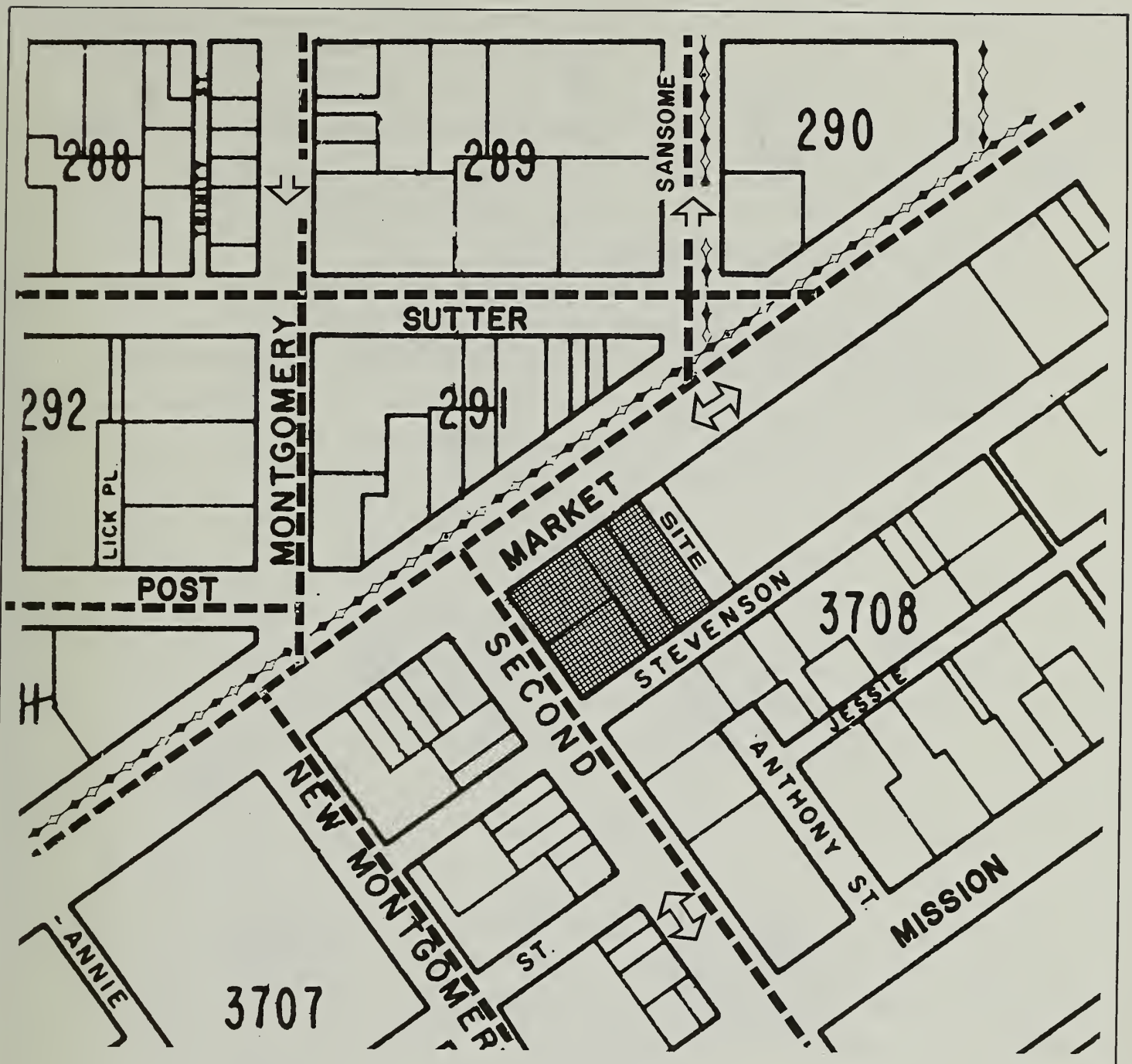
(1) Major and Secondary Thoroughfares*
Those streets in the project area which have been designated in the Transportation Element of the San Francisco Master Plan (Department of City Planning) are shown on Figure 14.

(2) Street System
Characteristics of the street network in the project area are shown on Figure 15. Existing traffic counts and capacity of these streets have been tabulated on Table 10, Page 63. Freeway access to and from the Peninsula and the East Bay is nearby, albeit highly congested during peak hours. The City street system provides access from San Francisco and (via the Golden Gate Bridge) Marin County, again within capacity restraints discussed elsewhere.

(c) On and Off Street Parking

Refer to Figure 16, Page 38, for the location of yellow zones (loading, parking restrictions). Yellow zones provide short-term parking for deliveries, loading and unloading. Observations (3/27/75) by ENDASCO in the midpart of the afternoon on a work day disclosed these loading zones to be extensively filled by double-parked delivery vehicles. This illegal parking is

* Definition: Major thoroughfares link districts within the City and distribute traffic from and to the freeways. Secondary thoroughfares serve as collectors and alternatives for the major thoroughfares.

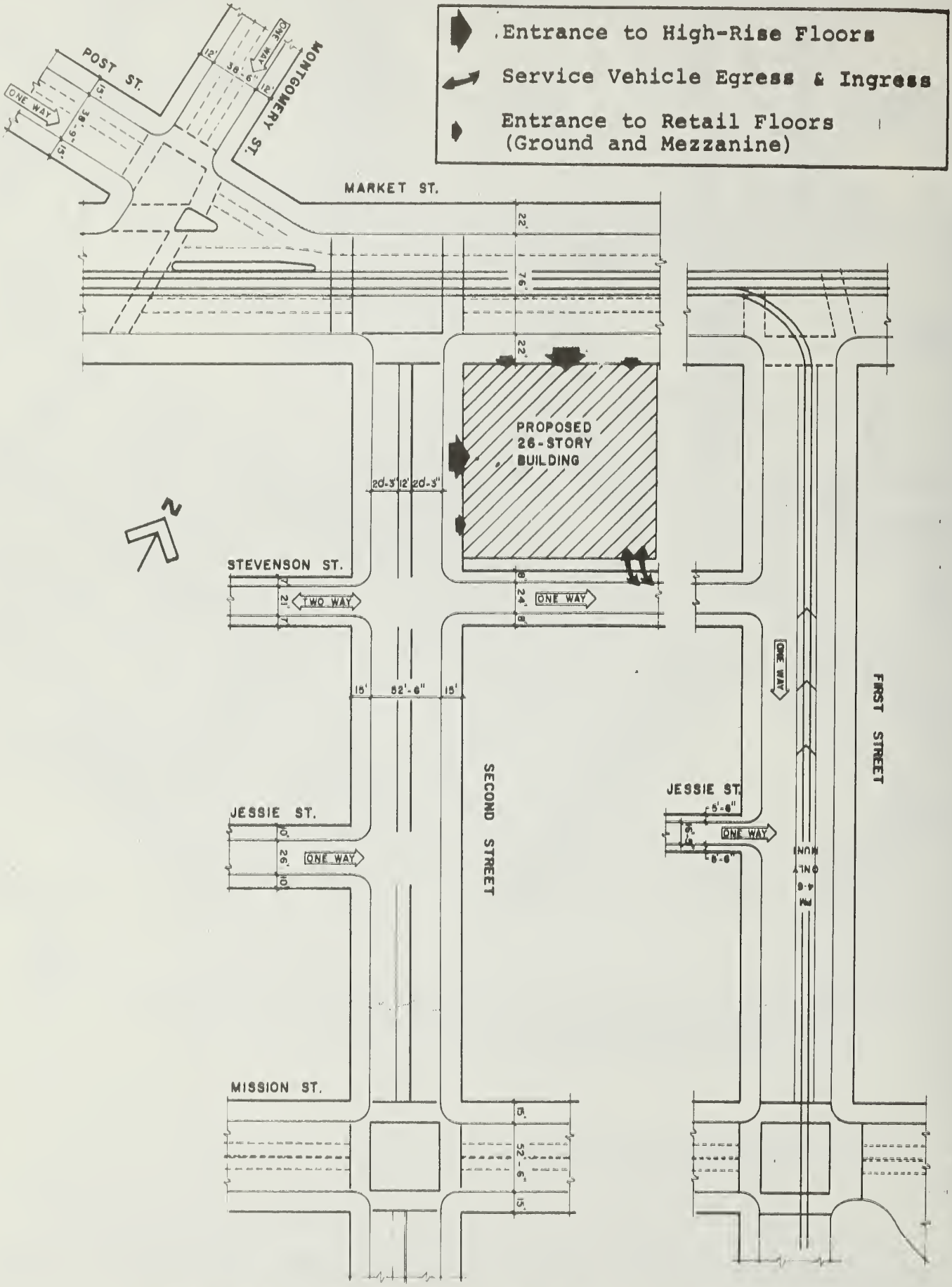


Existing/Proposed Transit Preferential Streets
Existing/Proposed Bicycle Routes
Major Thoroughfares

Source: The Plan for Transportation San Francisco Dept. of City Planning, 1972.

THOROUGHFARES, TRANSIT PREFERENTIAL STREETS AND BICYCLE ROUTES

Figure 14



EXISTING STREET NETWORK

Figure 15

contributing to traffic congestion in the area of the proposed project by restricting the orderly flow of traffic on these streets. Refer also to Figure 16 for the location and number of the metered parking spaces in the vicinity of the proposed project site. All the meters within a two-block radius of the site (73) limit parking to 30 minutes, and spaces were observed in mid-afternoon on a work day to be in constant demand (except for bays designated for service vehicles, there is no parking at any time along Market Street). Approximately 3,050 off-street parking spaces are available near the project site; 2,350 in garages and 700 in open parking lots. Refer to Figure 17, Page 39 for the location of the off-street parking. Conversation with the operator* of nearby lots disclosed that occupancy is "nearly full" in facilities south of Market Street and "full" in facilities north of Market Street every working day. Detailed data was not available.

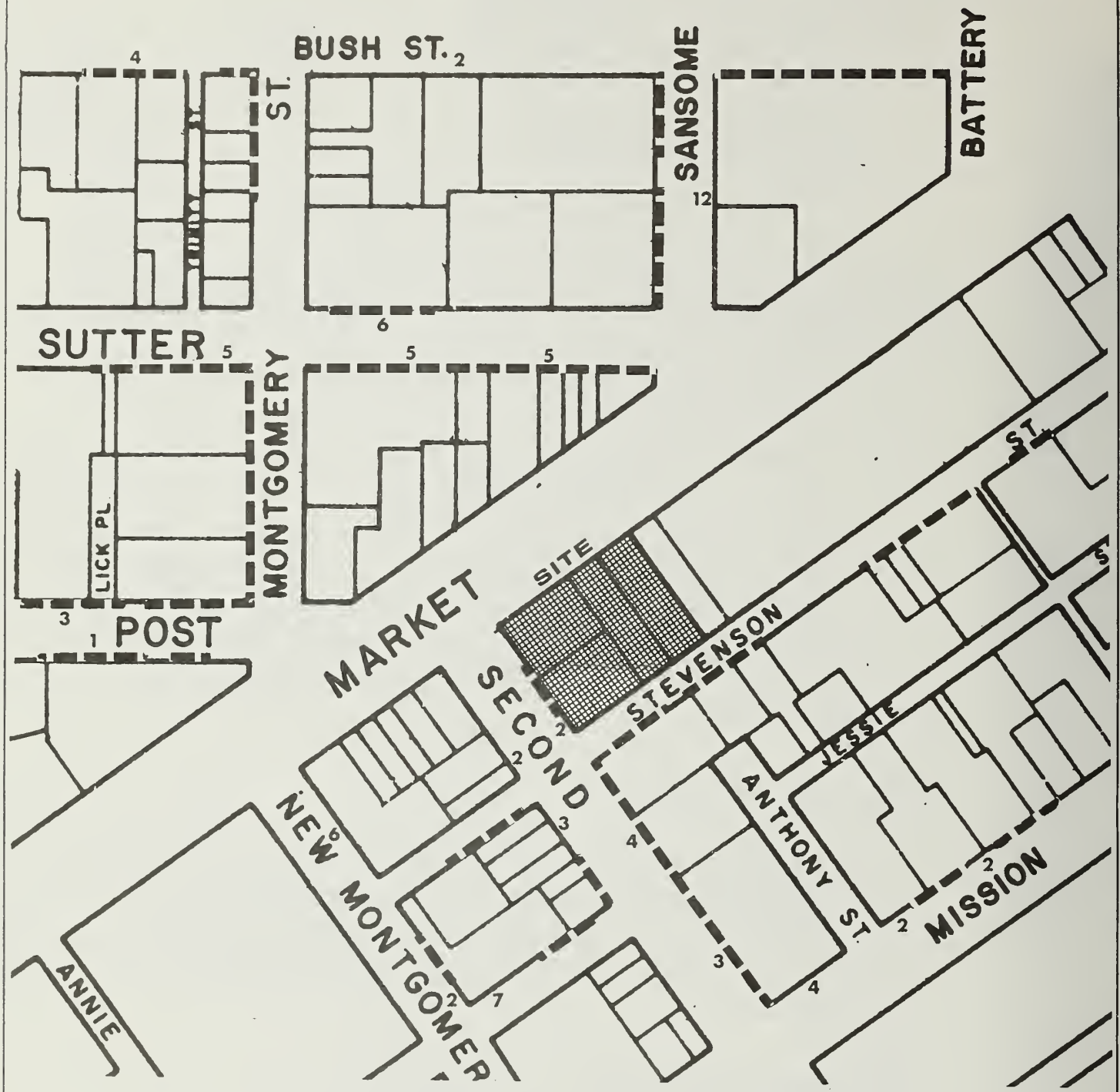
(d) Bicycle Access

All the streets in the area of the project are available for bicycle use, and except for delivery service, are not used to a great extent. Market Street has been designated as a bicycle route in the San Francisco Master Plan. (See Figure 14.)

(e) Pedestrian Access

All the streets in the area (except some which can be classified as alleys) have sidewalks for pedestrian

* Conversation with Mr. David Gold, Metropolitan Parking Corporation 10/24/75.

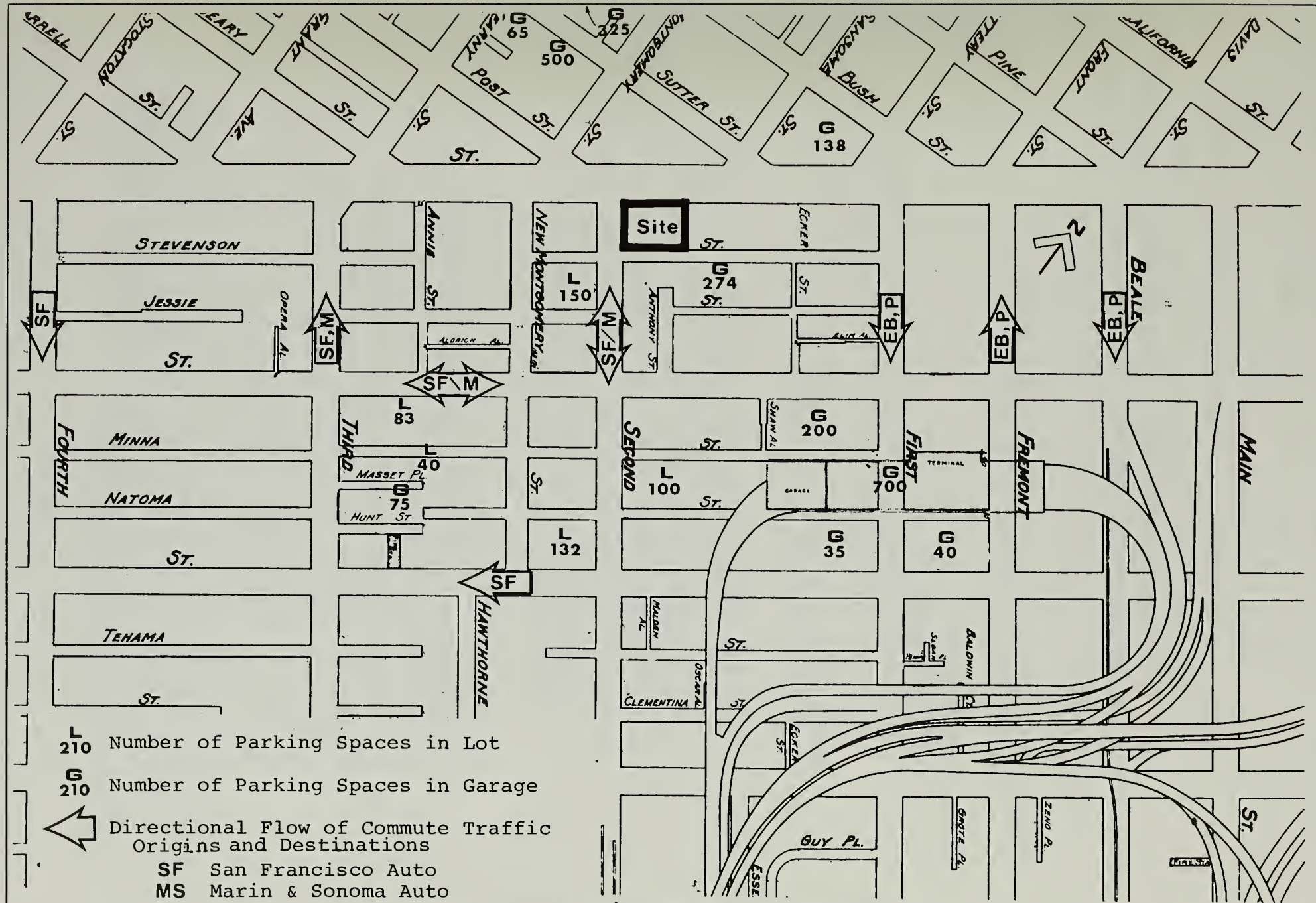


Peak Hour or Loading Zone Parking Restrictions

6 Number of 30-minute Parking Meters Along Street

ON-STREET PARKING

Figure 16



OFF-STREET PARKING AND COMMUTE ROUTES

Figure 17

traffic. A pedestrian count was conducted in front of 593 Market Street and 29 Second Street to determine the relative magnitude of the existing pedestrian movements along the Market and Second Street frontages. The result of this count is shown on Page 65.

III. THE ENVIRONMENTAL IMPACT OF THE PROPOSED ACTION

A. Seismic Hazard

1. Soil Stability

The proposed site falls on the edge of an "area of liquefaction potential" according to the San Francisco Seismic Safety Investigation prepared by John A. Blume and Associates. From the report:

> Liquefaction, the transformation of a granular material from a solid state into a liquefied state as a consequence of increased stress transmitted through the fluid that fills the voids between particles of a soil mass, results in reduced shear strength of the material. The shear strength of a sand is a function of the intergranular pressure in the sand and the coefficient of friction of the granular materials composing the sand.[1]

With the foundation system at 10-14 feet below grade, the proposed structure would rest upon the clayey siltey sands (Posey formation) previously mentioned on Page 20. This sand, a loose-to-medium-dense material, would be susceptible to liquefaction. The excavation of the 10-14 feet of material, presently acting as sufficient overburden pressure* to remove the threat of liquefaction, would confine this

[1] San Francisco Seismic Safety Investigation prepared for the Department of City Planning, URS/John A. Blume & Associates, Engineers, June 1974, Page 22.

* Overburden pressure creates the intergranular pressure in the sand mentioned in the quotation from the Blume report.

liquefaction solely to the area beneath the site; areas outside the boundaries of the foundation would not have the loose sand which creates the potential for liquefaction.[1]

2. Susceptibility to Earthquake Damage

The proposed structure's foundation loads would be transmitted down to the dense, relatively incompressible sands in the Posey formation beneath the bay mud using driven, precast concrete piles to a depth of approximately 50 feet below street level. The seismic considerations for the pile design would consist of the following which are taken from a project to the immediate east and deemed applicable to the site of the proposed project.

> Liquefaction potential of the dune sands and bearing sands.
>
> Lateral loads and deflections which may be imposed on the piling during the earthquake.[2]

The liquefaction consideration has been previously discussed on Page 40. The pilings proposed for the site would be prestressed and would be designed specifically for this proposed project's soil conditions and potential for deflection from a 1906-type earthquake.

The San Andreas and Hayward fault systems pass within about seven and twelve miles of the site respectively; and the structure would be subject to the seismic hazards which threaten all construction in the San Francisco area.

[1] Conversation with Mr. Frank Rollo (C.18126), Harding-Lawson Associates, May 7, 1975.

[2] Foundation Investigation, Proposed 575 Market Street Building, San Francisco, Dames and Moore, August 22, 1972, p. 22. Confirmed by Mr. Stephen Johnston (S.E. 714), Skidmore, Owings and Merrill.

B. Water

1. Drainage and Runoff

The site is completely covered with construction; therefore, no changes in drainage and runoff are expected.

2. Groundwater

Two weeks after drilling, the stabilized water level was measured at Elevation -7 (San Francisco Datum) or 23 feet below ground surface. However, it is known that the groundwater level in the area was lowered considerably during recent BART construction and has probably not yet returned to its normal level.[1] Data available from the nearby Standard Oil Building indicate that the groundwater level was at Elevation -3 in the spring of 1958.[2] This probably represents a seasonal high and the normal average water level would be close to Elevation -4.[3] Therefore, it is estimated that the groundwater level beneath this site will continue to rise another three to four feet but should be steady within the range of Elevation -3 to -4 (approximately 20 feet below ground surface) by the time of construction.

C. Air Quality

1. Exhausts from Heating Plant Presently on Site

Table 6 shows pollutants emitted by the gas-fired boilers supplying hot water to the structures to be removed.[4]

[1] Harding-Lawson, p. 5

[2] Dames and Moore, p. 7, Mr. Robert D. Darragh, Jr., (c 10,264)

[3] Ibid, p. 8.

[4] Based on existing data supplied by Pacific Gas & Electric.

2. Exhausts from Heating Plant of Proposed Project

Table 5 also shows pollutants which would be emitted from the proposed project by a combination of oil/gas-fired water tube boilers for which the maximum firing rate would be 8,000 ft^3 of natural gas per hour.

Table 6 EMISSIONS FROM COMBUSTION OF NATURAL GAS[1]

	Emissions From Existing Structures	Emissions From Proposed Structures
PARTICULATES	0.072 lb./hr.	0.14 lb/hr. (0.175)*
ORGANICS	0.027 lb./hr.	0.056 lb/hr. (0.07)*
NITROGEN OXIDES	0.583 lb./hr.	1.2 lb/hr. (1.5)*
SULFUR DIOXIDE	0.0003 lb./hr.	0.0006 lb/hr. (0.00075)*
CARBON MONOXIDE	0.0015 lb./hr.	0.0032 lb/hr. (0.004)*

The gas input rate represented in the metric system would be 2.3×10^6 Joules/sec. These rates cited are maximum rates. For estimates of the daily, weekly and seasonal variations, see Pages 52 and 53 of this report.

3. Construction Activities

Certain temporary reductions in air quality would occur in the vicinity of the building site due to truck traffic

[1] Based on Source Inventory of Air Pollutant Emissions in the San Francisco Bay Area, Bay Area Air Pollution Central District, 1973, p.34.

* Permissible units before mandatory review of permit by Bay Area Air Pollution Control District (BAAPCD).

in all phases of the proposed project. For a description of the measures proposed to minimize the effect of construction on air quality, see Page 74 of this report.

4. Reductions in Air Quality Due to Traffic Generated from Proposed Project

Although the number of anticipated employees and retail shoppers to the Market-Second site can be estimated (see Page 64), an accurate prediction of the deterioration of air quality due to the expected increase in auto traffic to the downtown area is beyond the scope of this report. It can be assumed, however, that the air quality would deteriorate in proportion to the numbers of autos generated by the proposed project.

D. Climate

1. Shadow

The changes that the proposed building would make in shadow patterns have been studied along with the effects of alternative, rectangular-shaped structure. The results of the proposed project can be seen in the Sun-Shadow Study found in Appendix A. Studies of the alternative design are available for inspection at the Department of City Planning. According to this study, the proposed hexagonal design of the structure would result in an apparent slight decrease in shadow from a rectangular-shaped building occupying the same site dimensions. This reduction is caused by a lesser bulk oriented toward the sun by the hexagonally shaped structure.

Included within the "Microclimate Impact Study" prepared by Environmental Impact Planning Corp. (EIP) are shadow diagrams for the existing and proposed structures. These shadow diagrams graphically compare shadows cast by nearby existing structures and the proposed structure for the four seasons of the year. The changes in shadow patterns which would be produced by the proposed 26-story structure are:

Fall, 1:00 p.m.	Partial increase and partial decrease in length of shadow cast across Market Street
Winter, 1:00 p.m.	Slight reduction in portion of shadow cast across Market Street
Spring, 1:00 p.m.	Same as Fall
Summer, 1:00 p.m.	Same as Fall

There would be no change in pattern for afternoon periods along Second Street should the proposed project be constructed.

Refer to the respective shadow diagrams, Pages A-1 through A-38 for further analyses of the changes in shadow patterns which would be brought about should the proposed project be constructed.

2. Wind

The changes that the proposed building would make in wind directions and velocities, together with their daily and seasonal variations and the concurrent variations in air temperatures, have been studied by the use of models in a wind tunnel.

All of these factors have been considered together to determine the varying degrees of comfort and discomfort which would be experienced in daytime during the year by the people standing or walking around the proposed plaza.

The present site has generally low discomfort frequencies, with the exception of the pedestrian areas on Market Street adjoining the site. The least comfortable area is the corner of Second and Market Streets. Construction of the project would make Market Street generally more comfortable, especially at the intersection of Second and Market Streets. Second Street, however, would become less comfortable in all seasons. For further information see the Wind Tunnel Study and Comfort Analysis in Appendix A.

E. Plant and Animal Life

The project site presently is completely covered by man-made structures. There is no on-site landscaping proposed which would be a likely habitat for animal species; there is, however, minor landscaping proposed for the roof areas (triangular) which might offer habitat for urban animal micro-species. The types of plantings are as yet unspecified.

F. Land Use

1. Pattern, Scale and Character

The dominant existing pattern, scale and character of the area surrounding the proposed building is high-rise commercial along Market Street. Whereas the south side of Market Street is characterized by rectangular buildings, the existing structures located on the north side of Market Street are characterized by more varied profiles. Refer to Figure 11,

Page 26, for the heights of adjacent structures. The six-sided design of the proposed structure would depart from the predominantly rectilinear pattern for the south side of Market Street in the general vicinity of the site. For further discussion of this matter, refer to the Visual Impact section of this report, Page 68.

2. Environmental Compatibility with Proposed Project

According to the definition of the site's zoning, C-3-O:

> This district, playing a leading national role in finance, corporate headquarters and service enterprises, and serving as an employment center for the region, consists primarily of high quality office development.[1]

Older buildings with downtown support uses can be found in the area.

G. Public Revenues and Services

1. Revenues

Total assessed valuation on Lots 42, 43 and 44 in Assessor's Block 3708 for land and buildings in the fiscal year 1974-75 was $772,300. An estimate of the assessed valuation (¼ of the value of the land and structure) would be $8,125,000 for the commercial development as proposed. The current tax rate (August, 1975) is $12.75/$100 assessment; therefore the proposed project would generate an additional

[1] San Francisco Downtown Zoning Study, Department of City Planning, 1966, Page 13.

$937, 470* over the current tax revenue generated by this property: $101,615 (San Francisco Assessor's Office).**

2. Police and Fire Protection

The San Francisco Police Department estimates that: 1) 0.7 police officer would be required to handle the increased police work related to incidents for which a police report would be generated by the proposed project. (about 50 incidents in twelve months would require police reports); and 2) about an additional 5 traffic citations per day would be generated by the project, a factor which would not adversely impact police manpower or services.[1]

The San Francisco Fire Department states that: 1) the proposed project will "...in no way adversely effect our ability to render service and 2) there will be no requirements for additional personnel or facilities."[2]

3. Solid Waste Disposal

The project would generate an estimated 2 tons of solid waste per day.

Golden Gate Disposal Company, which is under City contract in the project area, would place the waste

* Phone conversation with Ralph Borne, City Property Assessment, 9/8/75.

** Note: The estimate of additional taxes generated considers the current taxes paid by Stacey's Bookstore (Lot 44) to be the same before and after project completion. No attempt has been made to project the fiscal 1975-76 tax rate or assessment.

1 Phone conversation with Officer Robert Bernadini 5/5/75

2 Letter from Rene A. Gautier, Chief of San Francisco Fire Department Division of Planning and Research 12/30/74

in a holding area at 501 Tunnel Avenue in San Francisco and then transfer the waste within one day to the regional park sanitary landfill site in Mountain View.[1] Because the latter site probably will be filled by November 1975, Golden Gate Disposal is now negotiating for additional land in the regional park and for three other sites. The company anticipates no problems in obtaining a site.[2]

4. Liquid Waste Disposal

The proposed project would generate approximately 46,200 gallons per day[3] which would be discharged into the City's sanitary sewer system. This discharge would be handled by the North Point Sewage Treatment Plant, and would constitute .0007% of its average dry weather flow. This City plant would receive the discharges until the planned expansion of the Southeast Treatment Plant is completed. The capacity of the North Point Plant is frequently exceeded during wet weather when peak flow rates are high. During the 1973-74 fiscal year, for example, 47 overflows for a total of 113 hours were recorded.[4] During these periods the plant operates at capacity and discharges the excess flow into the San Francisco Bay at the Main and Howard Streets outfall.

1 The California Solid Waste Management Control Board in Sacramento has no "standards" for monitoring solid waste discharge by any type of land use; but tentatively, for "normal office/commercial use," the Board suggests using a generation factor of one pound per 100 square feet of floor space. The 2-ton estimate above results from application of the Board's factor. (Phone conversation with Ms. Elizabeth Cox, Planner, 8/14/75).

2 Phone conversation with Mr. Alex Nevins 9/5/75

3 Assumptions for sanitary sewer: Source: Skidmore, Owings & Merrill

(1) Criteria: 1 person per 150 sq. ft.; 15 gallons per day per person (higher square footage assumed for newer construction than for existing office space).

(2) Gross Area 462,000 sq.ft.

(3) Average Flow: 462,000/150 x 15 = 46,200 gpd.

4 Communication between ENDASCO and Mr. Mervin Francies of the Dept. of Public Works, Sanitary Engineering Div., Investigation Section, August 4, 1975

The North Point Plant provides advanced primary sewage treatment[1]; this level of treatment is not adequate to meet present State requirements or the provisions of the 1972 Amendments to the Federal Water Pollution Control Act (PL 92-500). The City's Wastewater Master Plan calls for the provision of full secondary treatment of sewage now transported to the North Point Plant. The Southeast Treatment Plant is to be expanded as a means of accomplishing this goal; this effort is scheduled to be completed by the end of 1979 (the proposed building would be completed in the Spring of 1978).

H. Population Density

The anticipated occupancy of the proposed structure would be 2,600 employees. This represents a 68% increase over the approximate 1,550 employees presently on the site.

I. Utilities

1. Water Consumption

In addition to the previously mentioned 46,200 gal./day (Page 49) anticipated water consumption by tenants of the proposed building, there would be an additional 14,400 gal./day consumed through evaporation (during cooling season only) in the rooftop

[1] In general terms, "primary treatment" will remove 50% of the pollutants; "secondary treatment" will remove 90% of the pollutants; and "tertiary treatment" will remove 99% of the pollutants.

refrigeration cooling towers.* Thus, the consumption rate on an average summer working day would be 60,600 gallons (0.0006% of average City consumption).

2. Gas Consumption and Electrical Consumption*

- The connected kilowatt load of the project would be 7,620 KW.
- The estimated average kilowatt hours of monthly consumption required to service all electrical needs a) in absolute amount would be 1,085,000 KWH, and b) per square foot of interior floor space would be 2.5 KWH/square foot.
- Anticipated daily and annual electric load distribution curves are shown on Figures 20-21, Pages 54-55.
- Gas consumption curves are shown in Figure 18 and 19 Note: gas consumption is shown rising during evening hours because the designers do not wish to allow the building to fall below 60 degrees.
- Estimated average consumption of gas (fossil fuel) in British Thermal Units** per square foot of interior floor space would be 300 BTU/square foot/day.

Included in the normal electrical (lighting receptacles, etc.) and gas (forced air heating) operational systems would be the air-conditioning systems including cooling and mechanical ventilation of all spaces. These systems would require roof-mounted penthouse fan rooms 14 feet in height.

* Source: Skidmore, Owings & Merrill (Proposed project's consumption shown in solid bar on Figures 18-21)

** The heat content of one cubic foot of natural gas is approximately equal to 1,000 BTU.

DAILY NATURAL GAS LOAD CONSUMPTION CURVE

(PEAK WINTER DESIGN DAY)

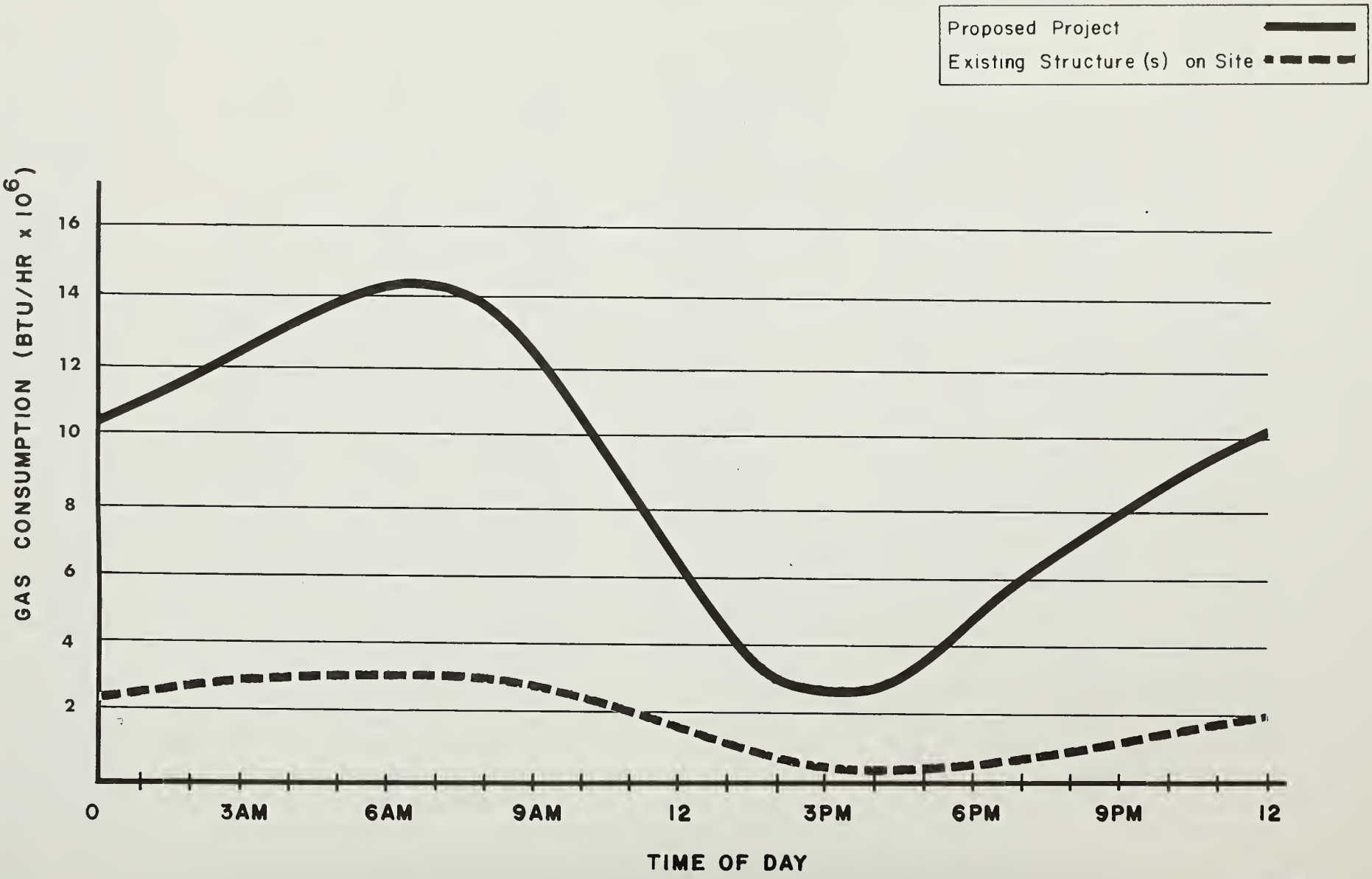


Figure 18

ANNUAL NATURAL GAS LOAD CONSUMPTION CURVE

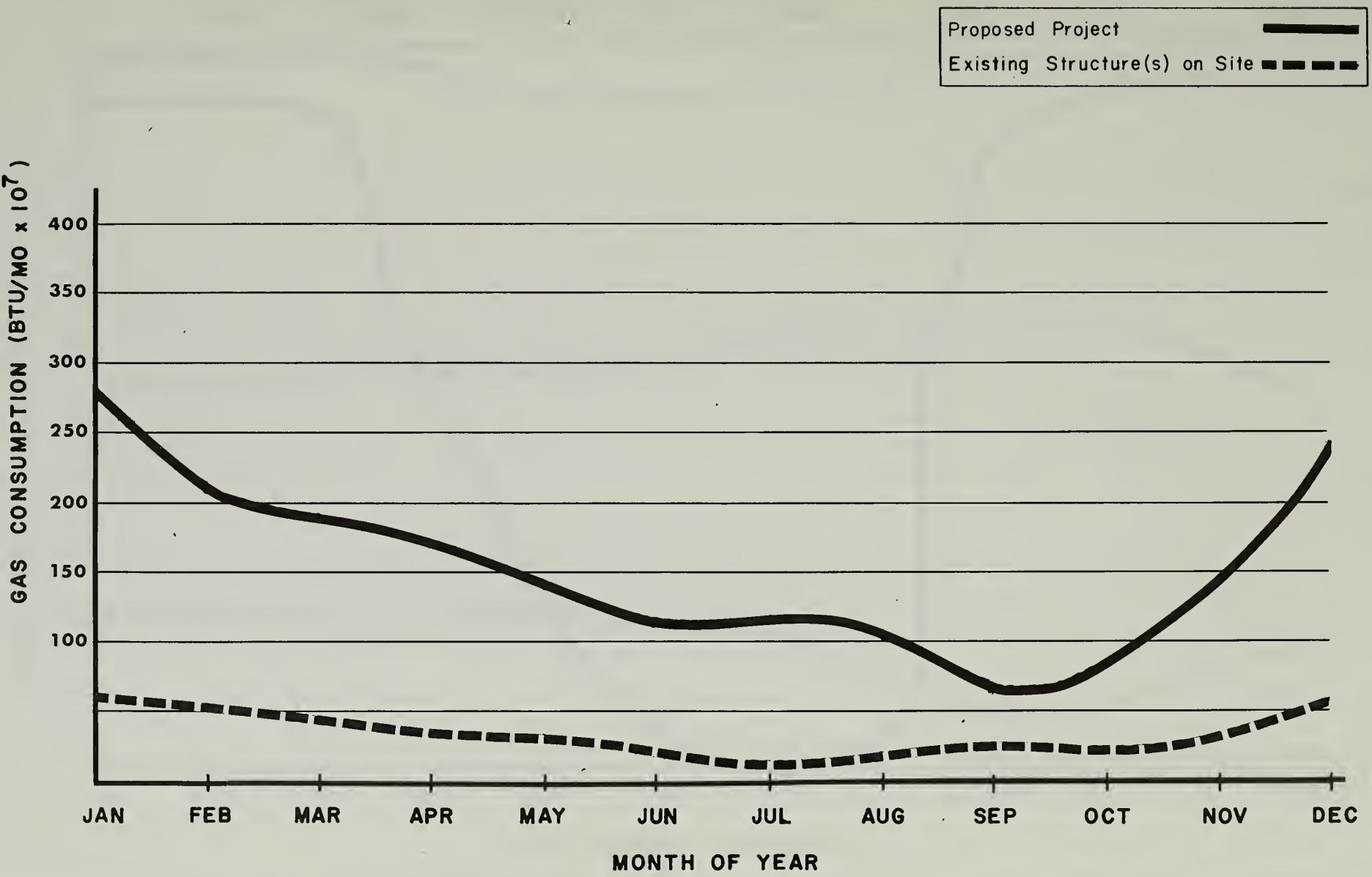


Figure 19

DAILY ELECTRICAL LOAD CONSUMPTION CURVE

(PEAK SUMMER DESIGN DAY)

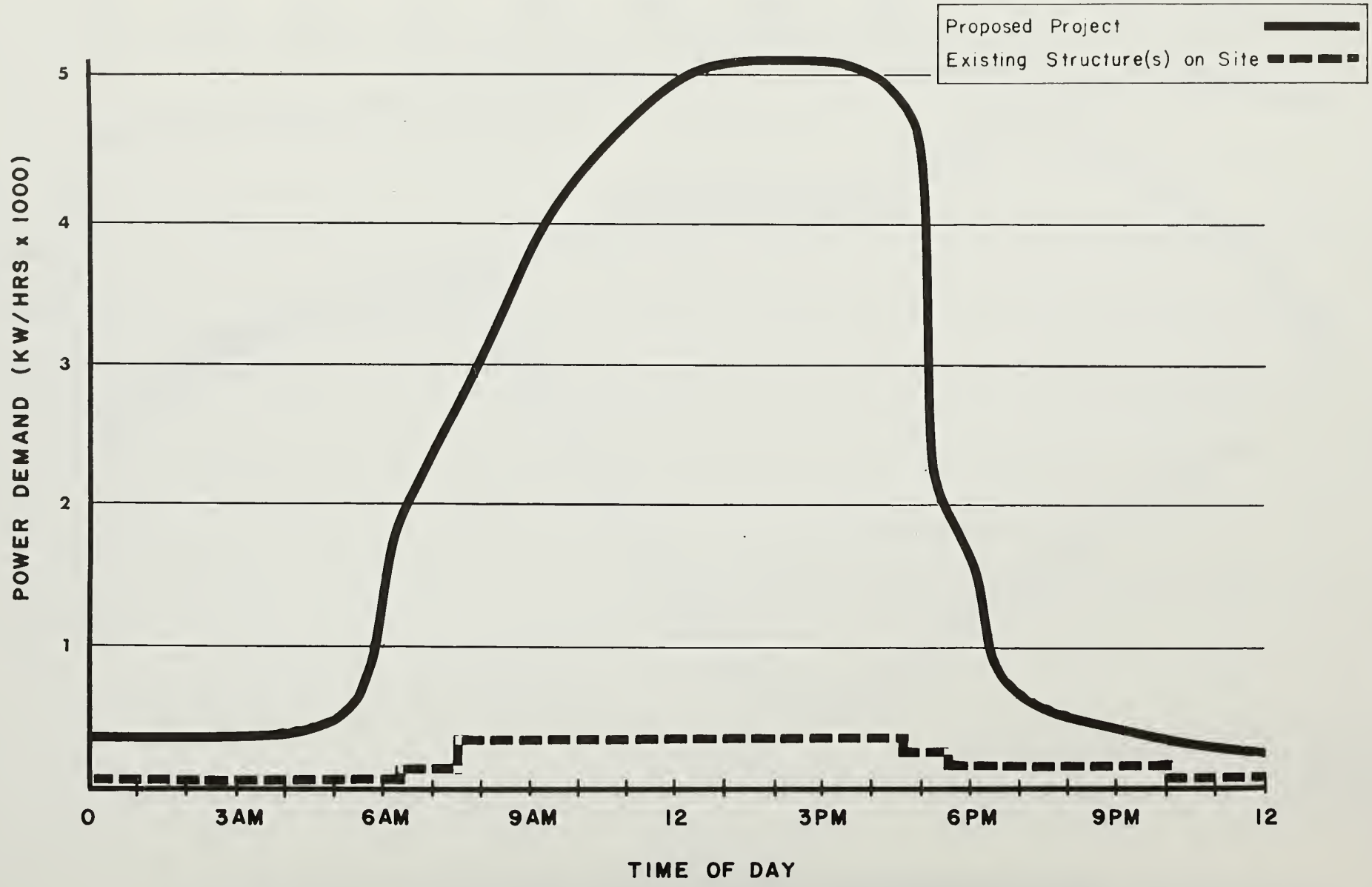


Figure 20

ANNUAL ELECTRICAL LOAD CONSUMPTION CURVE

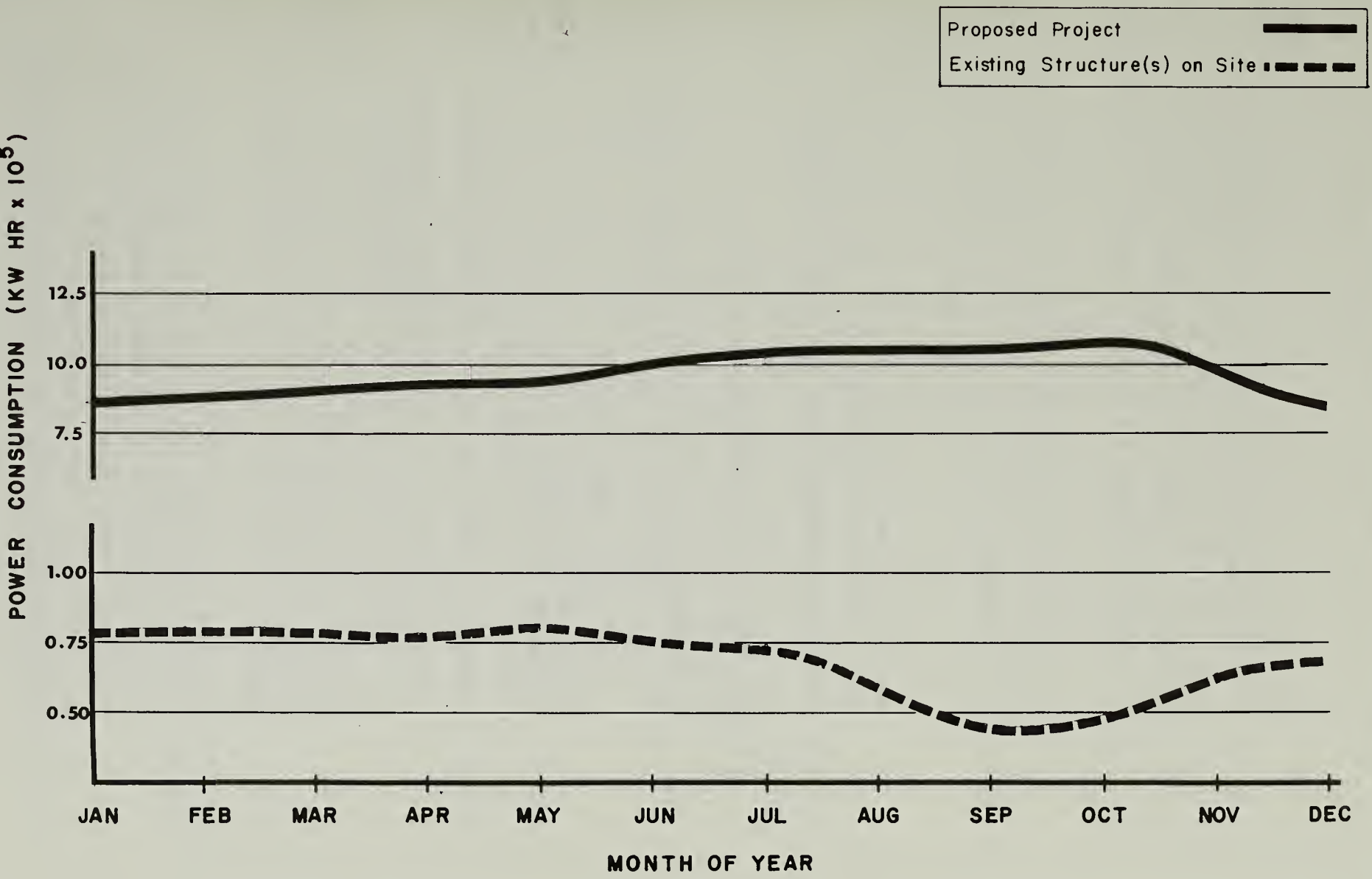


Figure 21

Chilled water, used for the air conditioning system, would be generated by two electrically driven water chillers located in the chilling central plant on the roof. These chillers would reject heat to an air-cooled cooling tower located in the vicinity.

Hot water would be generated by two combination oil/gas-fired water tube boilers which would be supplied to the various reheat coils on each floor by two (2) electrically driven water pumps. Fuel oil, stored on the site, would be used only when natural gas flow is interrupted by P.G. & E. Should fuel oil be used site specific air pollution would increase; predominately for Sulphur Dioxide.

J. Transportation and Circulation System

1. General

Throughout this section of the report, consideration will be given only to the impact generated by the estimated 1080 new office workers (see Page 57) who would inhabit the site.* It is assumed that the trips generated by the workers who replace those that were working in the buildings on the site would have the same distribution as those they replace since the ratio of clerical to professional is assumed to remain constant for new and old offices in the downtown area. Furthermore, the amount of commercial area on the ground and mezzanine floors of the building would be substantially the same as presently exists.

From data supplied by the San Francisco Planning Department and a recent survey conducted by the San Francisco Planning and Urban Renewal Association (SPUR) it is possible to anticipate the mode of

* Based on 30 sq. ft. per person for ground floor and retail, and 150 sq. ft. per person for offices.

transportation San Francisco workers use to get to their jobs, i.e., their "modal split." For the 1,080 employees estimated to be added to the Market-Second site, place of residence and modal split based on the two sets of data are presented in Table 8 . The estimate of dispersal of transit users to various operations is shown in Table 9 . For a more comprehensive analysis of the development of percentages used, refer to Appendix B.

A 38-story high-rise project is proposed for 444 Market Street, two blocks to the east. This 786,000 square foot development would be occupied by approximately 2,050 persons. The following table shows the transportation impacts from the additional employees who would be added to the site for the 444 Market Street* as well as the Market/Second Streets site.

TABLE 7

	444 Market	Second/ Market	Total
Number of Employees Added to Site	1,700	1,080	2,780
Peak Hour Trips Generated by Employees Added to Site			
Transit	540	300	840
Nontransit	650	250	900

The effect of auto traffic from the proposed structure would theoretically bring Third Street over capacity (see Table 10, Page 63).

* Draft Environmental Impact Report, 444 Market Street Project, (EE 74.253) San Francisco Department of City Planning, January 24, 1975.

TABLE 8

Place of Residence and Modal Split of Employees Added by Proposed Project

Location	Number of Employees		Mode of Travel			
			Auto		Transit	
	Number[1]	Percent[1]	Number	Percent[2]	Number	Percent[2]
San Francisco	542	50	157	29	385	71
Alameda/Contra C. Co.	233	22	128	55	105	45
Marin/Sonoma Co.	125	11	90	72	35	28
San Mateo Co.	162	15	100	62	62	38
Elsewhere	21	2	21	100	0	0
TOTAL	1,083	100	496	46	587	54

Note: There is a range of percent from Planning Department and "SPUR" statistics on Modal Split in this table. The average percent is used; refer to Appendix B for a further explanation on origin and use of statistics used.

1. Percent of total number of employees commuting from place of residence.

2. Percent of employees within place of residence commuting by Auto or Transit

TABLE 9

ESTIMATE OF TRANSIT MODE

		BART[1]	AC Transit[2]	Muni	Grey/SP	GGT
San Francisco	385	85		200 (St. Car) 100 (Bus/Trolley)		
East Bay	105	73	32		2	
Marin/Sonoma	35					35
San Mateo/ Peninsula	62	31			31	
Total	587					

1. "San Francisco Bay Area Rapid Transit District Station of Origin Data" Report No. T10002 BARTD, 07/24/75.

2. "Table No. 4, Mass Transit Passengers at Toll Plaza", Traffic Survey Series A-42, University of California, Institute of Transportation and Traffic Engineering, April 1974.

The cumulative impact from the 444 Market Street project would further impact this street in proportion to those auto commuters who would egress and ingress parking facilities via this street. No data on transportation impacts is available for the Standard Oil Building under construction on the adjacent site to the east of the Market/Second site.

2. Impact on Transit Ridership

The increase in transit ridership induced by the proposed project would be approximately 600 round trips per day. (See Table 8). Most of these would be Muni trips, although some would be BART, Southern Pacific and Golden Gate Transit. (See Table 9 for this distribution). Table 5, Page 32, shows those Muni lines presently exceeding seated capacities during the morning and evening peak hours. All of the Muni lines shown in the table would be further impacted by the proposed project. The two Muni lines in the vicinity (see Figure 13, Page 31) which are not at maximum seated capacity levels are the 15 and 40 lines; these lines would not be brought up to capacity levels by the proposed project.

Muni has estimated the capacity of its subway system in Market Street at 15,000 passengers per hour, compared to the 7,800 passengers per hour capacity of the existing streetcar lines.[1] Although afternoon peak hour patronage on BART[2] serving Alameda-Contra Costa Counties is above the available seats. The anticipated patrons (155) added by the proposed project could be accomodated when standing capacity is considered.

[1] Phone conversation with Mr. Larry Sauve, Transit Planner, Muni, 5/7/75

[2] Phone conversation with Mr. Ward Belding, Senior Economic Analyst, 8/6/75

Golden Gate Transit also is at a "standee" level during the afternoon peak hour; the anticipated increase in patrons (15) would not overflow the system.[1]

AC Transit to the East Bay is presently operating at levels above seated capacity on most lines during the evening peak hour.[2] The proposed project would add to the existing evening (4:30 p.m. - 5:30 p.m.) rush hour demand for this commuter service to the East Bay.

Southern Pacific service is operating at approximately 70% or 75% capacity during the evening (4:30 p.m. - 5:30 p.m.) rush hour. The added patronage (approximately 30 per day) as a result of the proposed project, would not bring the system to overflow capacity.[3]

Greyhound lines serving the Peninsula or Contra Costa County would permit increases in patronage as a result of the proposed project without causing overflow.[4]

3. Impact from Auto Traffic on Surrounding Streets

Table 10 shows project-generated trips and their impact on several surrounding streets.[5]

[1] Phone conversation with Mr. Ralph Lewiston, Route Planner, 8/6/75

[2] Phone conversation with Mr. R.W. Breall, Dispatcher, 9/9/75.

[3] Phone conversation with Mr. Houseman, Manager of Commute Traffic, 8/8/75

[4] Phone conversation with Mr. R. Phillips, Dispatcher, 6/25/75

[5] Estimated using a nomographic procedure derived by Jack E. Leisch from the Highway Capacity Manual (Highway Research Board, 1965). Inputs to nomographs were data on traffic direction; parking; right-of-way width; trucks and buses as percentages of total traffic; percentages of right and left turns; metropolitan area size; and the ratio of green time to signal cycle time.

The data presented in this table are based on the most probable routes of commute traffic used by residents from San Francisco, Marin-Sonoma, East Bay and the Peninsula. Refer to Figure 17, Page 39, for the impacted street system. From this analysis, Third Street, already near capacity, would exceed capacity when the anticipated auto users living in Marin-Sonoma and San Francisco are added.

4. Impact of Service Vehicles

The project architects (Skidmore, Owings & Merrill) estimate that 40-60 service vehicle trips per day on Stevenson Street would be generated by the continued commercial and office activity in the building. This would replace the current service access on Stevenson Street, which has been adequate so long as service vehicles observe the vehicle code and common courtesy. The increase in this activity would be 30 trips per day, occurring in off-peak hours.

5. Impact Upon Parking Facilities

While exact figures on the availability of off-street parking spaces are not available, it is believed that capacity is not sufficient to absorb the added 500 employee automobiles generated by the project. Thus some auto commuters would experience inconvenience in having to walk greater distances between their parked cars and offices than they do now. This may offer an incentive to existing, as well as added workers, to change modes. Such a change would be consistent with the objectives of the San Francisco Comprehensive Plan: Transportation.*

* Interpretation of Mr. Edward Green, Transportation Section, Department of City Planning, November 5, 1975.

TABLE 10 EFFECT OF ADDED AUTO TRAFFIC UPON NEARBY STREET SYSTEM [2]

STREET	CAPACITY	EXISTING COUNTS [1] (PEAK HOUR) *	TRIPS GENERATED BY PROJECT (PEAK HOUR) [5]*	RESIDUAL CAPACITY [3]	IMPACT (%) [4]
SECOND (@ Mission)	750	154 (northb'd)	22	596	4%
	750	103 (southb'd)	62	647	10%
FIRST (@ Mission)	1,800	1,070 (southb'd)	127	730	17%
THIRD (@ Mission)	1,800	1,731 (northb'd)	84	69	122%
FOURTH (@ Mission)	2,100	1,456 (southb'd)	71	644	11%
HOWARD (@ 3rd)	2,300	1,164 (westb'd)	71	1,136	6%
BEALE (@ Mission)	1,800	1,156 (southb'd)	127	644	20%
MISSION (@ Fourth)	1,150	942 (westb'd)	62	208	30%
	1,150	864 (eastb'd)	22	286	8%
FREMONT (@ Mission)	2,100	686 (northb'd)	127	1,414	9%

Refer to next page for footnote references

* Peak Hour: 60 minute interval when maximum volume of traffic occurs, usually during early morning or late afternoon.

6. Impact Upon Pedestrians

With no on-site parking provided, all employees and shoppers entering and leaving the site would have to walk. The anticipated net increase in employees would be 1,080 persons and it is assumed that 100% of the total person-trips would be generated during the 8:30-9:30 A.M., 12:00-1:00 P.M. and 4:30-5:30 P.M. hours, during the morning, noon and evening peak periods. It is assumed that the change in person-trips for the commercial businesses would be negligible. An estimated 390 (refer to Table 9) employees using BART or Muni subway would be entering the Montgomery Station directly in front of the site on Market Street during commute peaks. The existing pedestrians are shown in Table 11, page 65.

Footnote references for Table 10, Page 63

[1] Source: San Francisco Dept. of Public Works, Div. of Traffic Engineering.

[2] Based on weighted average of commuter distribution on the street system in the vicinity of the proposed project: a given intersection can be expected to carry a mix of commuters from outside districts, and this mix can be estimated on the basis of the most probable route of ingress and egress to parking facilities from the respective area of residence. Refer to Figure 17, Page 39, for a graphical analysis of the most probable routes for commuters.

[3] "Residual Capacity" defined as the capacity of the street system less the (peak hour) traffic count.

[4] Ratio of Trips Generated by Project ÷ Residual Capacity

[5] These estimates of trips passing through the respective intersection assume that some traffic passes through more than one intersection.

Off peak traffic can be estimated at 60% of peak hour traffic, and includes those employees who work irregular hours, those who must leave the office during the day and customers or clients who come to the building (Ref: Traffic Engineering Handbook, 3rd Ed., p. 146)

TABLE 11

PEDESTRIAN VOLUMES (TWO WAY)

	Market St. So Side, Near 2nd St.						Second St. East Side, Near Market St.					
	Existing		Added by Project*		Total		Existing		Added by Project*		Total	
	Vol.	pfm**	Vol.	pfm**	Vol.	pfm**	Vol.	pfm**	Vol.	pfm**	Vol.	pfm**
8.30 - 9.30 a.m.	475	3.1	486	3.2	961	6.3	260	1.7	208	1.4	468	3.1
12.00 - 1.00 p.m.	613	4.0	758	4.9	1,371	8.9	406	2.6	325	2.1	731	4.7
4.30 - 5.30 p.m.	327	2.1	486	3.2	813	5.3	515	3.3	208	1.4	723	4.7

* Assumptions: All BART and MUNI (streetcars) users enter directly opposite entrance to building, i.e., do not enter main pedestrian stream. Dispersal of remainder as follows:- 30% NE along Market Street towards First Street, 70% SW along Market Street of which 40% cross 2nd Street or Market Street and 30% turn down Second Street to the SE (Reference - Traffic Engineering Handbook, 3rd Edition, page 113).

** Levels below 9.0 pedestrians/foot/minute (pfm) indicates no restrictions to pedestrian movement. Calculations based on effective width of sidewalk at 15.4 ft. deleting to compensate for intrusion of BART entrance. (Reference: Pedestrian Planning and Design, John J. Fruin, 1971).

These pedestrian volumes have been related to persons per one foot of width of sidewalk per minute. During the period of 12:00 to 1:00 p.m. the pedestrian flow would be brought to a level of some restriction along the Market Street frontage. At other times of the day the added pedestrians would not bring about restricted flows along either Market or Second Streets.

K. Historical or Archaeological Sites

The site in its present condition reveals no evidence of remains of historical or archaeological interest. Refer to Mitigation Section, Page 75, for a discussion on steps to be taken if historical or archaeological materials are uncovered during excavation.

There appears to be no reason why the area in which the proposed building site lies should be included in a Historical District according to Mr. Ed Michael, Secretary, Landmarks Advisory Board, Department of City Planning 12/15/74.

L. Health and Safety

Noise Levels and Vibration

During the 24-month construction period, erection of the proposed building would result in construction noise and vibration. The highest levels would probably occur during the first five months during excavation and pile driving. Expected daytime noise levels for various types of equipment which would be used in the construction of the proposed 27-story building are found in Table 12.

The San Francisco noise ordinance requirements state that powered equipment (excluding impact equipment) shall not have a noise level exceeding 85 dBA* at 100 feet. The following Table lists the equipment which would be used for the proposed project; pile driver, jackhammer and pneumatic hammer shown would be exempt from the noise ordinance.

TABLE 12

Approximate Noise Levels Due to Construction

Construction Activity	Equipment	At 100 Feet from Construction dBA [1]
Excavation & Footings (3 months)	Pile Driver	91
	Mechanical Shovel	70
	Back Hoe	79
	Bulldozer	88
	Concrete Mixer	69
	Concrete Vibrator	58
	Trucks	85
	Saws	72
	Jackhammer	94
Framing (8 months)	Trucks	85
	Hammer (Pneumatic)	89
Finish & Clean Up (13 months)	Compressor	75
	Truck	85
	Saws	72
	Brooms	74

The following table illustrates several commonly experienced noise levels as a comparison to the expected values listed in Table 12.

* The dB (decibel) is a unit for measuring sound pressure. It is a logarithmic scale, with every increase of 10 dB representing a doubling of loudness. The dBA is a weighted measure of sound pressure which approximates the human physiological response to noise under conditions which include urban sound levels.

[1] San Francisco Noise Abatement and Control Ordinance No. 274-72, Section 2907, Construction Equipment, December 4, 1972.

TABLE 13

Typical A-Weighted Sound Levels Measured in the Environment and in Industry[1]

	Decibels
Jet Takeoff (200')	130
Freight Train (100')	70
Accounting Office	60
Soft Whisper (15')	30

M. Visual Impacts

Discussions among staff members of the Department of City Planning and architects for the project, Skidmore, Owings & Merrill, have pointed out that the proposed structure's shape would differ in design from typical South-of-Market high-rise construction.[2] Recently constructed buildings such as the Tishman Building (1973) at 525 Market Street and the newly-constructed Standard Oil Building at 575 Market Street, adjacent to the subject site, are of rectilinear shape. Planning staff members have stated that rectilinear-shaped structures complement the right-angled street grid pattern south of Market Street. Structures found on the north of Market Street, where intersections with Market Street are angular, are predominantly varied in design. An example of this variation in design of the facade is found in the Crown Zellerbach Building (1959) located at 1 Bush Street.

"Policies for Major New Development" in the Urban Design Plan states:

> Certain buildings will achieve visual prominence... because of their exposed locations. Among such locations are...those facing wide streets or closing the vista at the end of a street.[3]

[1] Peterson, A.P.G., and Gross, E.E., Jr., "Handbook of Noise Measurement," 7th Ed., P.G. General Radio Co., 1972

[2] Meeting conducted at City Planning on 1/10/74

[3] Urban Design Plan of the Comprehensive Plan of San Francisco Dept. of City Planning, May 1971, p. 91

Buildings of unusual shape stand out in the skyline. They call attention to themselves and correspondingly reduce the visual significance of other features in the City pattern.

The proposed structure would have the first 50 feet parallel to the property lines (rectilinear). The story tower section extending above the mezzanine level would be of an irregular hexagonal shape oriented diagionally across the site. Refer to Figure 22, Page 70, and the accompanying photographs (also, Figure 1, Page 1) for views of the subject site from various locations in the project area.

IV. ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED IF PROPOSAL IS IMPLEMENTED

A. Adverse Environmental Effects During Construction Period

Construction of the proposed building would increase noise and vibration levels, would increase hazards to the general public, and would decrease air quality during the two-year construction period.

B. Increased Demands for Protective Services

Construction and operation of the proposed building would cause increased demands for police protection costing the City an additional $77,000 per year.[1]

C. Increased Demands for Water, Gas and Electricity

The following consumption of utilities would be anticipated should the project be constructed:

Water	61,800 gallons/working day
Gas	7.7×10^6 BTU's/working day
Electricity	47,770 KWH/working day

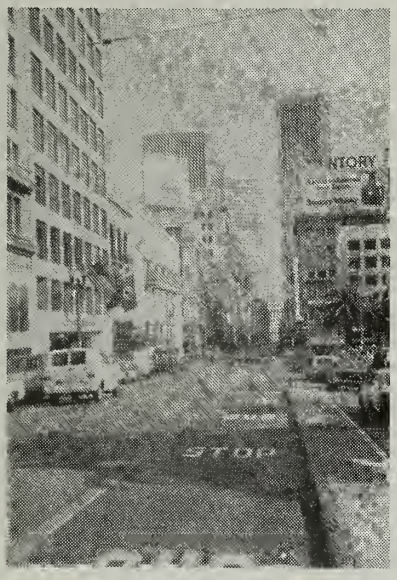
[1] Correspondence dated May 5, 1975 from Captain George Sully, Commanding Officer, Planning and Research Bureau, San Francisco Police Department

Location of Monuments and Landmarks

A Hallidie Building
B Sheraton Palace Hotel
C Lotta's Fountain
D Mechanics Monument
E Pacific Stock Exchange

PHOTOGRAPHIC VIEWS OF SITE

Figure 22



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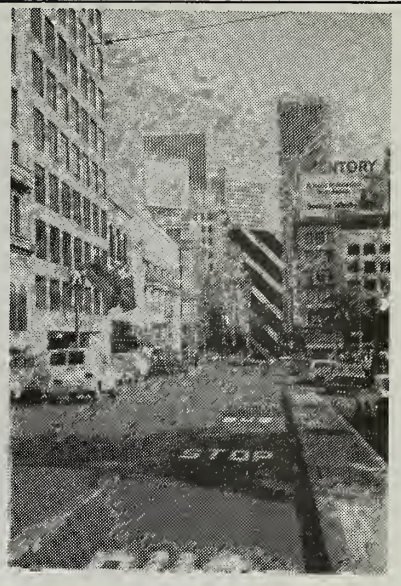


1b

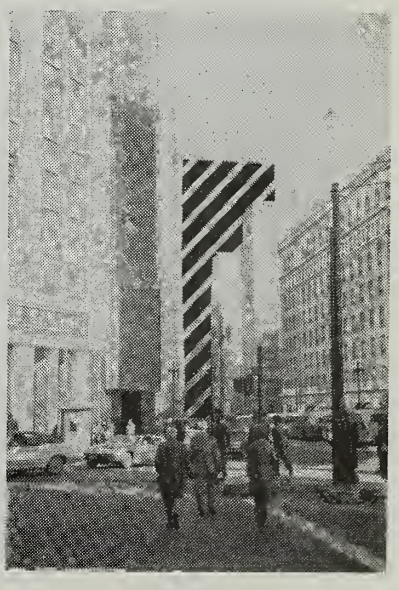
Existing

Proposed

2a

2b

3a

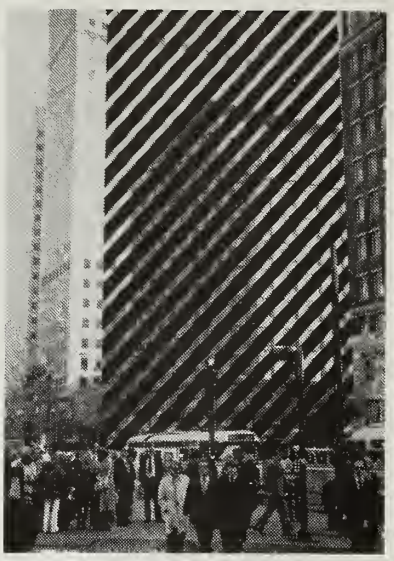


3b

KEY

Proposed Structure

4a

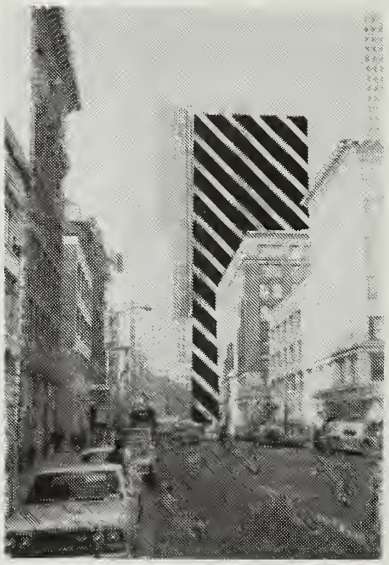


4b

Existing

Proposed

5a



5b

6a

6b

KEY

Proposed Structure

D. Increased Congestion and Crowding

There would be an additional increase of 500 persons employed on the site from that which presently exists. This would result in a larger number of people using the sidewalks and public transportation facilities during working hours.

E. Increased Demand for Liquid and Solid Waste Disposal

The proposed project would generate approximately 2 tons of solid waste and 46,200 gallons of liquid waste per day.

V. MITIGATION MEASURES PROPOSED TO MINIMIZE THE IMPACT

A. Energy Consumption

The following provisions would be incorporated into the design of the proposed structure to minimize the rate of energy consumption:*

- When the outside air temperature drops to below the air temperature inside the building, the central chilling plant equipment would be automatically turned off and outside air drawn in. This concept is known as "free cooling."
- Heating coils would be placed along the perimeter of the structure so that the hot water returning to the boilers would continuously balance building skin heat losses to the outside.
- Heat generated by lighting would be utilized as a bonus energy source to satisfy interior heat requirements. Ceiling cavities would be used as return air ducts to capture the heat given off by light fixtures.

* Standards of energy conservation are being developed by the American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) and by the Legislature of the State of California. The proposed structure will conform to California State energy conservation standards which go into effect January 1, 1976. These standards are similar to the ASHRAE, Code 90P.

- o Heating and cooling systems would be controlled automatically to avoid excessive temperature swings inside the building, i.e., controlling the hour-by-hour air conditioning loads of the building and the required cooling and/or heating effects to offset these loads. Thus, a minimum temperature of 65 degrees F. and a maximum temperature of 78 degrees F. would be maintained by tamperproof thermostats within occupied spaces.

B. Local Traffic Pattern and Street Blockage During Construction

Routes of entering and leaving truck traffic would be designated to minimize vehicular flows from congested areas. It is not intended that traffic would have to use Market Street during the excavation and construction phase of this proposed project. There would be assigned personnel to facilitate smooth scheduling of trucks to prevent stacking on adjacent street systems.

Upon application for the proposed project's site permit, inspectors from the Departments of Public Works and Police will inspect the site to determine the amount of sidewalk and/or street encroachment which would be necessary to accommodate truck traffic. All trucks must be inside the barricades when in a loading, unloading or holding status.[1]

C. Decrease in Air Quality During Construction

Airborne dust resulting from construction operations would be abated by oiling or wetting haul roads, by restricting construction-associated traffic to those roads, by wetting dusty areas during excavating and grading operations as well as during windy weather, by wetting or covering dusty materials loaded on trucks, and by keeping City streets and sidewalks free of dust, mud, load spillages, rubbish, and debris resulting from

[1] Conversation with Mr. John Phelan, Department of Public Works,6/12/75

construction equipment and operations. It should be noted that the soils at the foundation level are probably below the water table and are thus likely to be moist and naturally resistant to the formation of dust.[1]

D. Increased Noise and Vibration Levels During Construction

The following measures would be employed during the initial construction phase to reduce noise emissions transmitted to people near the work area:

- Checking sound emission of machines operating in concert by contractor-assigned personnel.
- Mufflers installed on all mechanical equipment air intakes and exhausts per guidelines in City noise ordinances and regulations.

The following measures would be considered by the developer for implementation during the excavation phase:

- Construction of a sound baffle around the site during the pile driving stage of the foundation phase. This baffle would be constructed of a fence-like screen of 10 feet consisting of extruded sheet metal on the inside, solid metal on the streetside and mineral wool tightly packed between or in another manner resulting in equally reduced noise impacts.
- Installing storm window-type covers on the upper floors (above 3rd floor) on adjacent buildings within 100 feet of the site.

The developer would implement the above two measures if:

1. The cost of implementing such devices would not adversely affect the economic feasibility of the project, in the opinion of the owner; or
2. The measures are required by legal proceedings.

[1] Conversation with Mr. Dennis H. Furby, (C. 24480), Harding-Lawson Associates, 6/12/75

E. Archaeological

If any material of potential archaeological or historical impact should be found on the site, the contractor will be legally bound by its contract to stop construction to permit professional evaluation of the find.

F. Increased Transit Service

The developer has stated its concern for the added auto traffic which would be created by the construction of the proposed project; however, Real Property West No. Two, Inc. does not feel that direct inducements to prospective tenents, relative to mode of travel, are in their interests as developers and operators of the property.

The developers hope that current efforts by various governmental agencies will result in employees either collectively, or through encouragement and incentive from their employers, utilizing high-occupancy vehicles (carpools or transit); and that financial conditions will permit future improvements in levels of service of public transit.

VI. ALTERNATIVES TO THE PROPOSED PROJECT

A. Site Alternatives

Other Available Locations

The proposed project could be constructed in other locations within the C-3-0 District of the CBD (Central Business District). This irregular-shaped area consists of approximately 50 city blocks and is bounded by Clay Street on the north, Kearny Street-Third Street on the west, the Embarcadero on the east and approximately the midpoint of the block between Mission and Howard Streets on the south (refer to Figure 2, Page 3). The specific site was chosen because it was available for purchase.

With a building of identical size to that proposed in this report located elsewhere than on Market Street (within the C-3-0 zone outlined on the Vicinity Map, Page 3), the change in impact would be concentrated primarily in the area of traffic circulation. Market Street offers varied public transportation access; the ready access to BART and Muni underground facilities from the present site provide minimal travel distances to these systems.

An alternative site on a street other than Market Street within the C-3-0 zone might increase automobile ridership as the distance to Market Street increases. Thus, ease of movement into and within the concentrated downtown core would be proportionately restricted.

An additional impact arising from an alternative site location other than on Market Street concerns visual prominence. The present site is located within the maximum allowable height limit permitted for the C-3-0 zone: 700 feet. Other height limits within the C-3-0 zone range down to 300 feet. At 402 feet the proposed structure is lower than many structures existing or proposed along Market Street in the vicinity (refer to aerial photograph, Page 25); therefore, it would not rise above nearby buildings as it would, say, in a zone of 450 feet maximum height limit (an area roughly bounded by Sacramento, mid-block of Kearny and Montgomery, Pine and Sansome Streets) where the heights of the existing structures are considerably lower than the 402 ft. of this proposal. The one notable exception within this 450 ft. height limit zoning district is the 778 ft. Bank of America Building at California and Sansome Streets which was constructed before enactment of the height limit.

B. Design Alternatives

1. Taller Structure

A taller structure could be built on the site. With the maximum floor area of 495,092 sq. ft. (utilizing the corner bonus) theoretically permitted for this site vs. 450,943 sq. ft. proposed (tower and Stacey's Bookstore) there could be an additional one floor.

With each floor in the tower at 12,200 sq.ft. (net rentable) there would approximately be an additional 80 persons employed. These additional employees (a 3% increase) would add, proportionately, to the demand for utilities, liquid and solid waste and transportation systems serving the site.

Changes in wind and discomfort impacts are not estimated.

2. Square vs. Hexagonal Structure

If a square tower were proposed there would be a potential for 19 floors calculated in the following manner: (See following page.)

Maximum Allowable Floor Area (20% corner bonus)	494,760 sq.ft.
1st - 12th Floors (no bulk restriction)	353,640 sq.ft.
13th-19th Floors (bulk restriction)	124,950
	478,590 sq.ft.*

In this example there would be no provisions for open space at the base of the tower, i.e., the structure would rise from the property lines.

All impacts discussed in Section IV of this report would remain constant with the exception of the changes in wind patterns around the site. In the Microclimate Impact Study found in Appendix B, the winds resulting from a square structure were found to be higher along Market Street than for the proposed design. Also discussed in this appendix are the wind pattern changes resulting from rotating the proposed structure 45 degrees; here, again, the resulting wind flows along Market Street would be of higher intensity than the proposed design orientation.

C. Use Alternatives

1. Combining Commercial and Residential

One alternative use would be a development scenario based on 50% of the proposed project (184,100 sq.ft.) devoted to residential units. For the purpose of formulating this alternative, a residential mix based on the Golden Gateway Project is assumed; this development currently has a 2% vacancy rate, and as such could be considered a successful downtown residential project. The mix of units in Golden Gateway is:

* An additional floor would exceed the permitted floor area by 1,680 sq.ft. Alternative bonus proposals might allow for the addition of this added floor area, thus raising the number of floors to 20.

37% studios; 52% one-bedrooms; 11% two-bedrooms; and 4% three-bedrooms. Based on this mix, the alternative project would contain 75 studios (650 sq. ft.); 105 one-bedroom units (950 sq. ft.); 22 two-bedroom units (1,100 sq. ft.) and 8 three-bedroom units (1,300 sq. ft.) Rents at levels comparable to Golden Gateway would not provide an acceptable economic return on developers investment: studios @ $215/mo.; one-bedrooms @ $300/mo.; two-bedrooms @ $355/mo.; three bedrooms @ $715/mo.

The mix of units mentioned above would generate approximately 35¢/ft.^{2}/mo. By comparison, the average rental rate of $1/ft.^{2}/mo. maybe projected for the proposed project, although the actual rental figures are not yet available.

No parking would be required for dwelling units in the C-3-O zone; however, dwelling units constructed on the site would undoubtedly be unattractive to prospective tenents without parking spaces provided. Any parking spaces provided would add to the traffic circulation difficulties in the downtown area.

Dwelling units in a C-3-O district would require Conditional Use authorization by the City Planning Commission, as would any parking in excess of 7% of the total gross floor area of the proposed building (which would permit about 100 spaces).

2. "No Project"

If the project were not undertaken, the buildings on the site most likely would continue as they now exist. Those office and retail tenents presently occupying the spaces (to date, approximately 65% of full occupancy) in the site's three structures scheduled for demolition would not be displaced. The "No Project" alternative would eliminate all the adverse impacts generated by the proposed project described in Section IV, pps 69 - 73, such as traffic and associated pedestrian congestion, shadow and wind increases and utility consumption.

VII. THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

A. Cumulative and Long-Term Effects Which May Adversely Affect the Environment

Small, but continuing additions would be made by the proposed project to the problems of air pollution, sewage and solid waste disposal, and traffic congestion. Similarly, small, but ongoing increases would be effected in the demands for police and fire protection, utilities, public transit and parking. These additions and increased demands, when added to those of other proposed developments in the area, would have an adverse effect on the environment. Whether or not this effect or certain of its elements would be cumulative and would operate adversely over the long term would depend upon how the combined increases in revenue to utility companies and public agencies, which would result from the proposed projects, are used to improve existing and future systems and to reduce pollution.

B. Narrowing of Beneficial Uses of the Environment and Long-Term Risks to Health and Safety

Long-term risks to public health and safety would result from the project's continuing contributions, both direct and indirect, to the problems of air pollution, sewage and solid waste disposal, and congestion of both vehicle and pedestrian traffic. These risks could be eliminated or at least substantially mitigated by the eventual improvement of the systems and services affected.

C. Why the Proposed Project Should Be Undertaken at This Time

Building the proposed project now rather than holding the land for alternative action, while representing an immediate risk to the City in terms of increased environmental demands and impacts, would nevertheless develop the land at a magnitude, in terms of scale and occupancy load, at lower than maximum levels (height and/or floor area) for this zoning district. Such future alternative projects could conceivably produce greater environmental impacts

than the present proposal, although Planning Commission policy of automatic Discretionary Review for proposed structures along Market Street could prevent this. Also possible for future alternatives is a project governed by different zoning restrictions if changes in the Planning Code should occur.

A marketing study prepared for the owner of the site has recommended immediate development to realize profit expectations for the real estate investment.

VIII. ANY IRREVERSIBLE ENVIRONMENTAL CHANGES WHICH WOULD BE INVOLVED IN THE PROPOSED ACTION SHOULD IT BE IMPLEMENTED

Construction of the proposed project would expend nonrenewable materials and energy sources. Subsequent operation of the building would continue to expend nonrenewable energy sources. The total amount of each material and resource expended in connection with the construction and operation of the proposed building would be, by itself, a small part of the total amount of that material and resource still available. Such depletion of material and energy sources can be expected to continue until suitable alternatives are developed; efforts toward the development of such alternatives are currently being made.

IX. THE GROWTH-INDUCING IMPACT OF THE PROPOSED PROJECT

It is expected that the tenants of the building would represent the expansion of existing San Francisco corporations (or government agencies) and the establishment of new offices in San Francisco by other corporations. The specific expected ratio of relocated to new business tenants has not been determined.

Because some employees would undoubtedly seek to live in San Francisco, increased demand would be placed on the City's low-vacancy-rate housing stock.

The project would add an approximate 250,000 square feet net increase in office and retail space in the Central Business District. The proposed structure would probably generate support businesses in the vicinity of the site. Examples of these anticipated businesses would be printing, banking, office supply, and eating establishments. In addition to the proposed project, six other projects nearby are under construction or design. Refer to Table 14 for these projects and their location. If the proposed project is highly successful in terms of occupancy, particularly if space is heavily reserved prior to completion, then further high rise office construction would be encouraged in the Central Business District.

TABLE 14 FUTURE OFFICE BUILDING PROJECTS

(IN CONSTRUCTION, IN DESIGN OR POTENTIAL NEAR 2ND AND MARKET STREETS)

Project Name And/Or Location	Gross Area in Office Buildings (Square Feet)	Project Status
1. Yerba Buena Center Redevelopement Project	683,000	Portions of YBC project in design
2. One Market Plaza Two office buildings (forty-three stories and twenty-eight stories) in the block bounded by Market, Steuart, Mission and Spear Streets.	1,800,000	In construction
3. Standard Oil. Forty story building at 575 Market Street.	568,000	
4. Bechtel Corporation. Two twenty-four story buildings in block bounded by Market, Beale, Mission and Fremont Streets.	1,100,000	In design
5. Howard & Main Office Building (Borel Company). Thirteen story building, northeast corner of Howard and Main Streets.	235,000	In design
6. Bank of Tokyo. Twenty three story building at northeast corner of California and Sansome Streets.	350,000	In construction
7. Gateway Plaza Project. South side of Mission between Main and Beale Streets.	Unknown	Project dormant for past three years
8. Transbay Terminal site. South side of Mission between Beale and First Streets.	Unknown	Potential project location
TOTAL	4,736,000	sq.ft. in six of eight projects
ESTIMATED NET OFFICE SPACE (@ 85% of total)	4,025,600	sq.ft. in six of eight projects

Data Sources: San Francisco Department of City Planning, "Tall Buildings in San Francisco Downtown Study Area" August 1, 1975.

IX. EIR AUTHORS AND CONSULTANTS: ORGANIZATIONS AND PERSONS CONSULTED

Department of City Planning 100 Larkin Street San Francisco, CA 94102 Environmental Review Officer: Selina Bendix, Ph.D., EIR Coordinator: Ralph Gigliello	Authors of Environmental Impact Report
Environmental Data Service Company 680 Beach Street, Suite 431 San Francisco, CA 94109 441-3779 Contact: Mr. George W. Faltico	Authors and Production of preliminary Draft Environmental Impact Report
Skidmore, Owings & Merrill Project Architects One Maritime Plaza, Suite 1800 San Francisco, CA 94111 981-1555 Contact: Mr. Alan Rudy (C-2541)	Architects and Engineers
Environmental Impact Planning Corp. Microclimatic Impact Consultants 319 Eleventh Street San Francisco, CA 94103 626-9034 Contact: Donald Ballanti	Wind and Comfort Analysis
Harding-Lawson Associates 155 Montgomery Street San Francisco, CA 94104 391-0545 Contact: Mr. Frank Rollo (C 18126)	Preliminary Soil Investigation
James B. Lubin (C 12149) 1620 Montgomery Street San Francisco, CA 94111 956-6707	Traffic Consultant
Pacific Gas and Electric Company 245 Market Street San Francisco, CA 94105 781-4211 Contact: Mr. Paul Evens	Existing Energy Consumption

Mr. Clifton C. Brinkley
150 Post Street
San Francisco, CA 94104
397-9397

Construction Consultant

APPENDIX A

MICROCLIMATE IMPACT STUDY ON THE PROPOSED
SECOND AND MARKET STREET BUILDING

SAN FRANCISCO, CALIFORNIA
July 3, 1975

EE 74.322

APPENDIX A

TABLE OF CONTENTS

July 1975

I. INTRODUCTION

Architects, engineers, and city planners designing urban structures are limited by the lack of information on wind effects brought on by the presence of these structures, such as discomfort for pedestrians and wind-caused mechanical problems with doors, windows, and ventilating systems. Once a structure is built, remedial measures (if they exist at all) are usually very expensive.

It is virtually impossible to anticipate, by analysis or intuition, the winds that will be caused by a structure, since they are determined by very complex interactions of forces. Fortunately it is possible to predict the wind patterns and pressures around structures by testing scale models in a wind tunnel that can simulate natural winds near the ground. This allows the designer to foresee possible environmental and mechanical problems and alleviate them before the building is erected.

Data from wind tunnel tests can be combined with climatological data to analyze the effect of a proposed structure on pedestrians in terms of human comfort. The frequency distribution of wind strengths at pedestrian level, combined with temperature data and shadow patterns of the proposed structure and its surroundings, can be used to forecast comfort at pedestrian levels.

The research was conducted in two phases. The current wind environment of the site was measured in Phase 1. The impact on the wind environment caused by construction of the proposed building was evaluated in Phase 2.

II. SUMMARY

A wind tunnel investigation was carried out on models of the site as it exists and as it would exist with the proposed building. An analysis of comfort was conducted, taking into consideration winds and sunshine.

The study results show that high winds now occur near the site. The highest winds are along Market Street adjacent to the project site.

Construction of the project would decrease winds along Market Street while increasing winds along Second Street. Other areas would remain relatively unchanged.

The analysis of comfort showed that relatively low discomfort frequencies now occur near the site. The Second and Market intersection was the least comfortable area, having discomfort frequencies as high as 22 percent during some seasons.

The project would make Market Street more comfortable. The area across from the Standard Oil Building would be affected by the shadow cast by the proposed building, however. The Second and Market intersection, although improving in comfort, would still have the greatest discomfort frequency. Second Street would experience a small increase in discomfort frequency.

III. BUILDING AND SITE DESCRIPTION

The project site is in the downtown area of San Francisco on the southwest end of the block bounded by Market, Second, Stevenson, and First Streets. It is currently occupied by four building ranging in height from 30 to 132 feet. There are currently three high-rise buildings on the block, the tallest being 549 feet high, and there are several high-rise structures north, northwest, and west of the site. The area to the southwest, south, and southeast currently contains low and moderately high buildings. The planned Yerba Buena Center, south of the project site, would contain several high-rise buildings.

The current height and bulk zoning near the site is shown in Figure 1.

The project involves construction of a hexagonal high-rise building on a 45-foot-high square base; the total height is 409 feet. The entrance is at the corner of Second and Market Streets. A plan of the proposed building and surrounding buildings is shown in Figure 2.

IV. MODEL AND WIND TUNNEL FACILITIES

Model

A scale model of the proposed building and nearby structures was constructed of polystyrene and urethane foams, using blue-line prints supplied by the architect. A model of the structures surrounding the area for a distance of several blocks was constructed of polystyrene and urethane foams.

The model scale was one inch equals 30 feet. The model of the surrounding city area was built to this scale with building configurations and heights obtained from the Sanborn maps at the San Francisco Department of City Planning.

The model with the proposed building was placed on a turntable in the wind tunnel, allowing it to be turned to simulate the various wind directions.

Wind Tunnel Facilities

The Environmental Impact Planning Corporation boundary layer wind tunnel was designed specifically for testing architectural models. The working section is 7 feet wide, 43 feet long, and 5 feet high. Wind velocities in the tunnel can be varied from 3.5 mph to 13 mph. The flow characteristics around sharp-edged objects such as architectural models are constant over the entire speed range. Low speeds are used for photographing tracer smoke, high speeds for windspeed measurements.

Simulation of the characteristics of the natural wind is facilitated by an arrangement of turbulence generators and roughness upwind of the test section. These allow adjustments in wind characteristics to provide for different scale models and varying terrain upwind of the project site.

Measurements of windspeed around the model are made with a hot-wire anemometer, a device that relates the cooling effect of the wind on a heated wire to the actual windspeed. The flow above the city is measured by a Pitot tube

connected to a micromanometer. The Pitot tube and micromanometer measure directly the pressure difference between moving and still air. This pressure difference is then related to the actual windspeed. Flow visualization is achieved by use of floodlit smoke in conjunction with a 35-mm. camera.

V. TESTING METHODOLOGY

Simulation of Flow

The most important factors in assuring similarity between flow around a model in a wind tunnel and flow around the actual building are the structure of the approach flow and the geometric similarity between the model and the prototype. A theoretical discussion of the exact criteria for similarity is not included in this paper, but may be found elsewhere (Cermak 1966, or Cermak and Arya 1970).

The variation of windspeed with height (wind profile) was adjusted for the scale of the model and the type of terrain upwind of the site. The profiles used were those generally accepted as adequately describing the flow over that type of terrain (Lloyd 1967).

Testing Procedure

The windflow characteristics of the site in its present state were investigated to ascertain the present wind environment. Windspeeds and wind directions at specified points throughout the site were measured and recorded. Wind direction was measured by releasing smoke at each point and recording the direction in which the smoke traveled. Windspeed measurements were made at the same points, at a scale height of five feet above the ground. A hot-wire anemometer probe is required to make these measurements within a fraction of an inch of the model surfaces. The probe is repeatedly calibrated against the absolute reading of a Pitot tube and micromanometer. Velocity readings close to the model are generally accurate to within 10 percent of the true velocity.

A similar technique was used to measure the wind environment with the proposed building in place. Measurements were taken around the building and on the adjacent streets.

Before and after each test run, a calibration measurement was made above the model. The purpose of these measurements

was to relate the wind tunnel measurements to actual wind records from U. S. Weather Service wind instrumentation located on the Federal Building at 50 Fulton Street.

VI. TEST RESULTS AND DISCUSSION

Tests of windspeed and wind direction were conducted for five wind directions.

Measured windspeeds are expressed as percentages of the calibration windspeed, which corresponds to the actual windspeed at the San Francisco Weather Station. Thus a plotted value of 52 means that the measured windspeed is expected to be 52 percent of the windspeed recorded by the Weather Service when winds are from that particular direction.

The plotted values can be interpreted in terms of general "windiness" using the scale below. This scale is subjective and is based on information gathered from similar studies in San Francisco.

Velocity	Percentage of calibration windspeed
Low	0 - 19
Moderately low	20 - 29
Moderate	30 - 49
Moderately high	50 - 69
High	70 - 100
Very high	>100

It should be noted that the plotted values are not actual windspeeds, but ratios. Thus a point having "very high" windspeed would still experience light winds on a near-calm day. Likewise, a point found to have "low" winds could experience significant winds on an extremely windy day.

Wind direction is indicated by an arrow pointing in the direction of flow. Where wind direction fluctuated, two arrows representing the principal flow directions were plotted. Areas of fluctuating winds are normally turbulent, as are areas of spiraling motion; the latter are denoted by curved arrows.

Northwest Wind

Northwest winds occur 12 to 39 percent of the time in San Francisco, depending on the season. (In meteorology, a northwest wind blows from the northwest.) Northwesterly and westerly winds are the most frequent and the strongest winds at all seasons in San Francisco. Northwest winds exceed 13 miles per hour 35 percent of the time and 25 miles per hour 3 percent of the time in summer. Wind frequencies and speeds are lower in spring, fall, and winter.

The site is well protected from northwest winds by the high-rise development north and northwest of the site. The existing site has moderate winds along Market and Second Streets and low-velocity winds along Stevenson Street (see Figure 3). There is considerable turbulence, especially along Second and Stevenson Streets.

Construction of the proposed building would not change the wind velocities appreciably. Velocities would remain moderate on Market and Second and low on Stevenson (see Figure 4). Turbulence along Second Street would be reduced.

West Wind

West winds occur between 15 and 40 percent of the time, depending on the season. They exceed 13 miles per hour 29 percent of the time and 25 miles per hour 7 percent of the time in summer. Wind strengths and frequencies are somewhat lower in spring, fall, and winter.

West winds are funneled eastward down Post Street and across Market. The flow splits at the site, with a portion proceeding southwest down Second Street and the remainder northeast along Market. Winds on Market adjacent to the site are high; along Second they are moderately high. Winds along the northwest side of Market Street are moderate, but relatively turbulent (see Figure 5).

Construction of the proposed building would decrease winds on Market Street adjoining the site from high to moderately high velocities. The greatest reduction would take place on the eastern corner of the Second and Market intersection (see Figure 6). Wind velocities on Second and Stevenson Streets would be increased by a small amount, while winds elsewhere would be unchanged.

Southwest Wind

Southwest winds occur on an average of 9 percent of the time in San Francisco. Winds are highest in winter, when they exceed 25 miles per hour 2 percent of the time.

Southwest winds flow northeast along Market Street and southeast down Second Street (see Figure 7). Moderate winds on Market in front of the site accelerate to high velocities further up the block near the Standard Oil Building. Winds on Second are moderately low; winds on Stevenson reach moderately high velocities.

Figure 8 shows the effects of the proposed building on the wind environment. Wind velocities on Market would be slightly higher adjoining the site but would decrease near the Standard Oil Building. Windspeeds along the northwest side of Market would decrease slightly. Winds on Second Street adjacent to and across from the site would increase from moderate to moderately high velocities. Winds on Stevenson would increase slightly.

South Wind

South winds are infrequent except during winter storms, when moderate to strong wind is often combined with rain. They occur 12 percent of the time in the months of December through February, exceeding 13 miles per hour 1 percent of the time. During other seasons south winds are light and occur less than 3 percent of the time.

Figure 9 shows the present wind environment under south wind conditions. Windspeeds are high on Market Street adjacent to and across the street from the Standard Oil Building. Elsewhere winds are in the moderately low to moderate range.

Construction of the proposed building would lower wind velocities slightly on both sides of Market Street (see Figure 10). Winds on Second Street near Market would be increased from moderate to moderately high velocities. There would be slight increases on Stevenson Street.

Southeast Wind

Southeast winds occur less than 3 percent of the time in spring and summer and 6 percent in fall. They are generally

light during these seasons. In winter they can be expected 17 percent of the time, with speeds over 13 miles per hour 10 percent of the time.

Figure 11 shows the wind environment at the site under southeast wind conditions. Winds are moderately high on Market Street at Stacy's and the Standard Oil Building, and along the northwest side of the street. The flow along the southeast side of Market is generally turbulent. There are also moderately high to high wind velocities along Stevenson Street. There are low to moderate winds throughout the rest of the site.

Construction of the proposed building would reduce winds in front of and across from Stacy's and the Standard Oil Building (see Figure 12). The wind would remain turbulent, however. Winds on Second Street would increase from moderate to high velocities on both sides of the street; the greatest increases would occur at the Second and Market and the Second and Stevenson intersections.

VII. MICROCLIMATE IMPACT ANALYSIS

A. ELEMENTS OF COMFORT IN SAN FRANCISCO

The elements that influence comfort are temperature, humidity, sunshine, precipitation, and wind. Their relative importance varies with geographic location and the characteristics of the local climate. For the San Francisco region, the most important factors are temperature, solar radiation, and wind.

Temperatures in San Francisco are moderate owing to the influence of marine air. Temperatures are highest in fall and lowest in winter; both spring and summer are normally cool, with a high frequency of low clouds and fog.

The intensity and frequency of sunshine are normally integrated into a single figure and expressed as "percentage of possible sunshine." San Francisco has two peak periods of sunshine, in April and in September. These months normally correspond to the transition periods between the strong marine airflow of summer and the transient storms of winter.

Wind in San Francisco is strongest in late spring and throughout the summer months, and lightest in winter. Summer winds have a large daily variation, with light winds during night and morning hours and peak winds in the afternoon. Westerly winds are dominant in all months but December and January.

B. MICROCLIMATE ANALYSIS

Sun-Shade Patterns

Sun-shade diagrams were prepared for each phase of the project at 1 p.m. for the first day of each season. The sun-shade patterns were taken from sun-shade photos prepared by Endasco and were incorporated into the comfort diagrams (Figures 13-20).

Spring-Fall 1 p.m. P.S.T.

Shadows at the existing site are shown in Figure 13. The northwest side of Market Street is mostly sunny with the exception of the Second and Market intersection. The southeast side of Market is mostly shaded.

Construction of the proposed project would shade a section of Market Street across the street from the Standard Oil Building. Shadows elsewhere near the site would remain the same (see Figure 14).

Winter 1 p.m. P.S.T.

Figure 15 shows the existing shadow patterns during winter. Most of the area is in shadow with the exception of the Second and Stevenson intersection and across Market from the Standard Oil Building.

The proposed building would block out the sunlight across Market from the Standard Oil Building but would provide sunlight across Market from Stacy's. Sun-shade patterns remain the same throughout the rest of the site (see Figure 16).

Summer 1 p.m. P.S.T.

The existing site is mostly sunny during summer. There is shade on the southeast side of Market, along the west side of Second, and along the south side of Stevenson (see Figure 19).

The proposed building would increase areas of shade on the south side of Market adjoining Stacy's but not across the street. The rest of the site remains the same (see Figure 20).

Comfort

Pedestrian discomfort in the wind is caused by mechanical effects (flapping clothing, blowing dust and rain) and thermal cooling. The mechanical effects are usually assumed to occur above 11 miles per hour (Penwarden 1973); thermal cooling can cause discomfort at lower windspeeds.

Predicting frequency of discomfort due to thermal cooling requires detailed information on clothing levels and pedestrian activities, and correlations between windspeed, wind direction, and temperatures in San Francisco. A methodology has been developed to predict thermal discomfort combining these factors with wind tunnel results and information on solar radiation (Arens 1972); however, the detailed climatological information needed is not currently available.

An alternate technique has been used in this report of considering only mechanical wind effects to predict the frequency of discomfort. The results are an estimate of discomfort frequency that is conservative in that the effects of temperature, rain, and solar radiation are neglected in the calculations. These factors, however, are considered subjectively in the analysis of comfort.

The methodology of estimating discomfort involves predicting the frequency of 11-mph winds at each point of interest for each wind direction by combining the wind tunnel results with information on windspeeds from the San Francisco Weather Station on Fulton Street and from San Francisco International Airport. These frequencies are then weighted by the proportion of time that the wind blows from each wind direction during the season of interest. The result is an objective estimate of pedestrian discomfort due to the mechanical effects of wind.

The comfort analysis was carried out for 1 p.m. on the first day of each season. The hour chosen was assumed to correspond to the time when people would most want to be outdoors to eat lunch, shop, or go for a walk.

Fall

Discomfort frequencies for the existing site are shown in Figure 13. They are generally low throughout the site, with the exception of the pedestrian areas along Market Street adjacent to the site. The highest frequency of discomfort occurs near the intersection of Second and Market Streets. The southeast side of Market and the southwest side of Second experience slightly higher frequencies because of the lack of sunshine.

Figure 14 shows comfort conditions after construction of the proposed building. Comfort would be increased slightly along the east side of Market Street. Small increases in

discomfort frequency would occur along Second Street, and across from the Standard Oil Building, where the project's shadow would block the sunshine.

Winter

Discomfort figures for winter are low and have a small range (Figure 15). Actual discomfort levels would be higher because of temperature effects, shadows, and rainfall (which occurs about 12 percent of the time). As in fall, the higher winds along Market adjoining the site and along Second Street cause the highest discomfort frequencies to occur there.

Discomfort levels would decrease to a small extent along Market Street with implementation of the project (Figure 16). Second Street would experience a very small increase in discomfort.

Spring

Existing comfort conditions in spring are shown in Figure 17. Currently there is a large difference in comfort between the two sides of Market Street. The northwest side very low discomfort values and is in the sun; the southeast side has relatively high discomfort frequencies and is shaded. The highest discomfort frequency occurs at the east side of the Second and Market intersection. Frequencies elsewhere are generally low.

The effect of the proposed building is shown in Figure 18. The east side of Market would become more comfortable, while the west side across from the Standard Oil Building would be shaded and therefore less comfortable. Discomfort frequencies would increase on both sides of Second, and Stevenson would be unaffected.

Summer

The comfort analysis for summer shows a pattern similar to that of spring (see Figure 19). The southeast side of Market has relatively high discomfort frequencies and is shaded; the northwest side has low frequencies and is in the sunshine. The Second and Market intersection experiences the highest frequency of discomfort, while the remaining areas near the site are very comfortable.

As in spring, construction of the proposed building would increase summertime comfort along Market Street (Figure 20). The greatest improvement would occur at the east corner of the Second and Market intersection. Second Street itself, however, would be less comfortable.

Summary

The present site has generally low discomfort frequencies, with the exception of the pedestrian areas on Market Street adjoining the site. The least comfortable area is the corner of the Second and Market intersection.

Construction of the project would make Market generally more comfortable, especially at the Second and Market intersection. Second Street, however, would become less comfortable in all seasons, although the magnitude of change is not large.

VIII. MITIGATION MEASURES

There are two types of mitigating measures for wind. The first is to make major design changes to reduce winds near the project, such as different building orientations or changes in size or shape. Two alternative building designs were also tested in the wind tunnel. The first was a structure of similar height with a rectangular shape; the second was identical to the current project but rotated 90 degrees. In both cases, winds along Market Street were found to be higher than with the proposed design. A copy of the report of this test is on file with the Office of Environmental Review, San Francisco Department of City Planning.

The second type of mitigation measure involves additions to the project that would provide local shelter for pedestrians. Small structures such as kiosks for newspaper or flower vendors, telephone booths, and shelters at bus stops can serve in this way. Similarly, street trees and other vegetation can function as windbreaks. A program for provision of both small structures and street plantings is currently being implemented by the City's Market Street Reconstruction Project.

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FIGURE 1 SITE LOCATION MAP

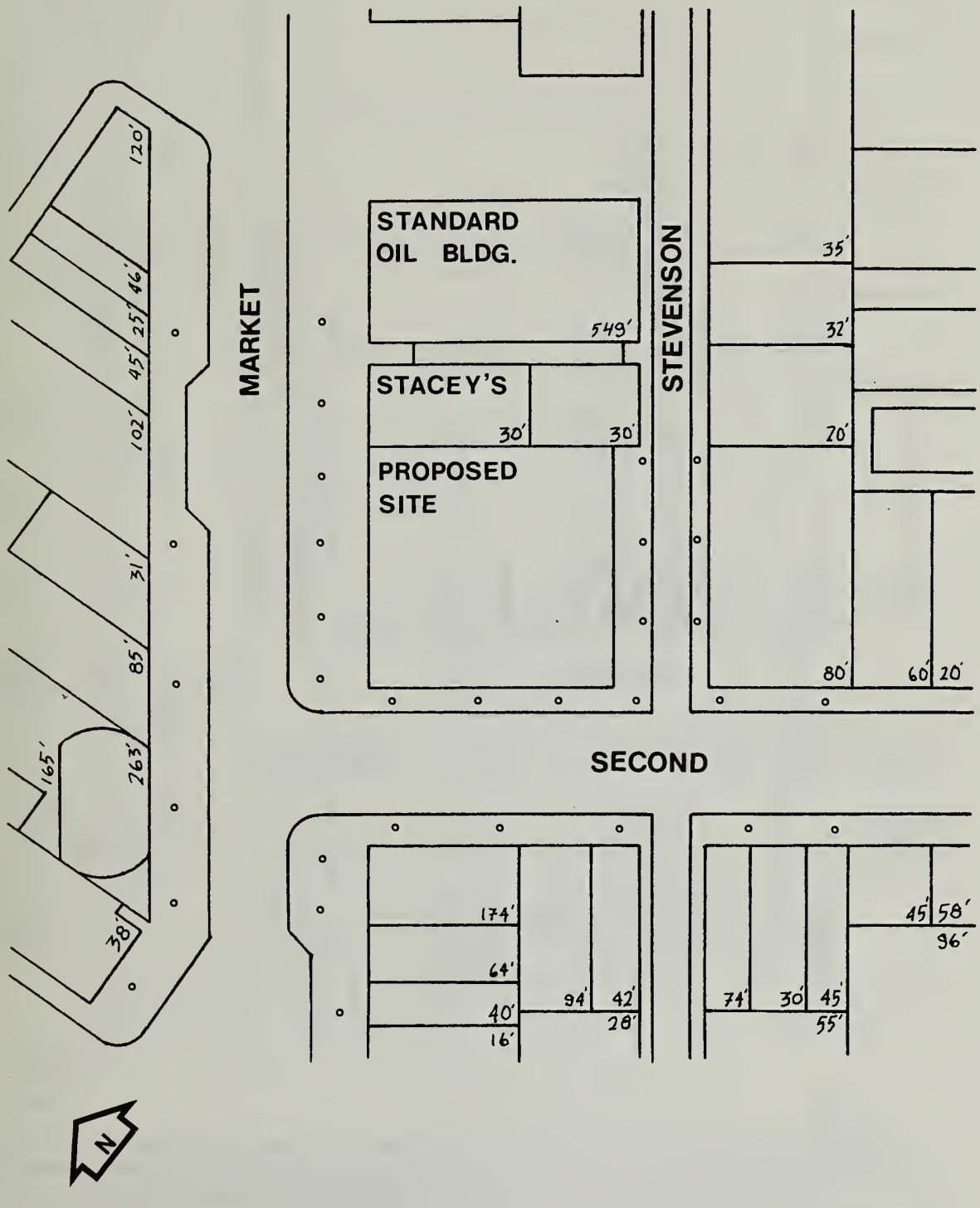


FIGURE 2 HEIGHT & BULK ZONING MAP

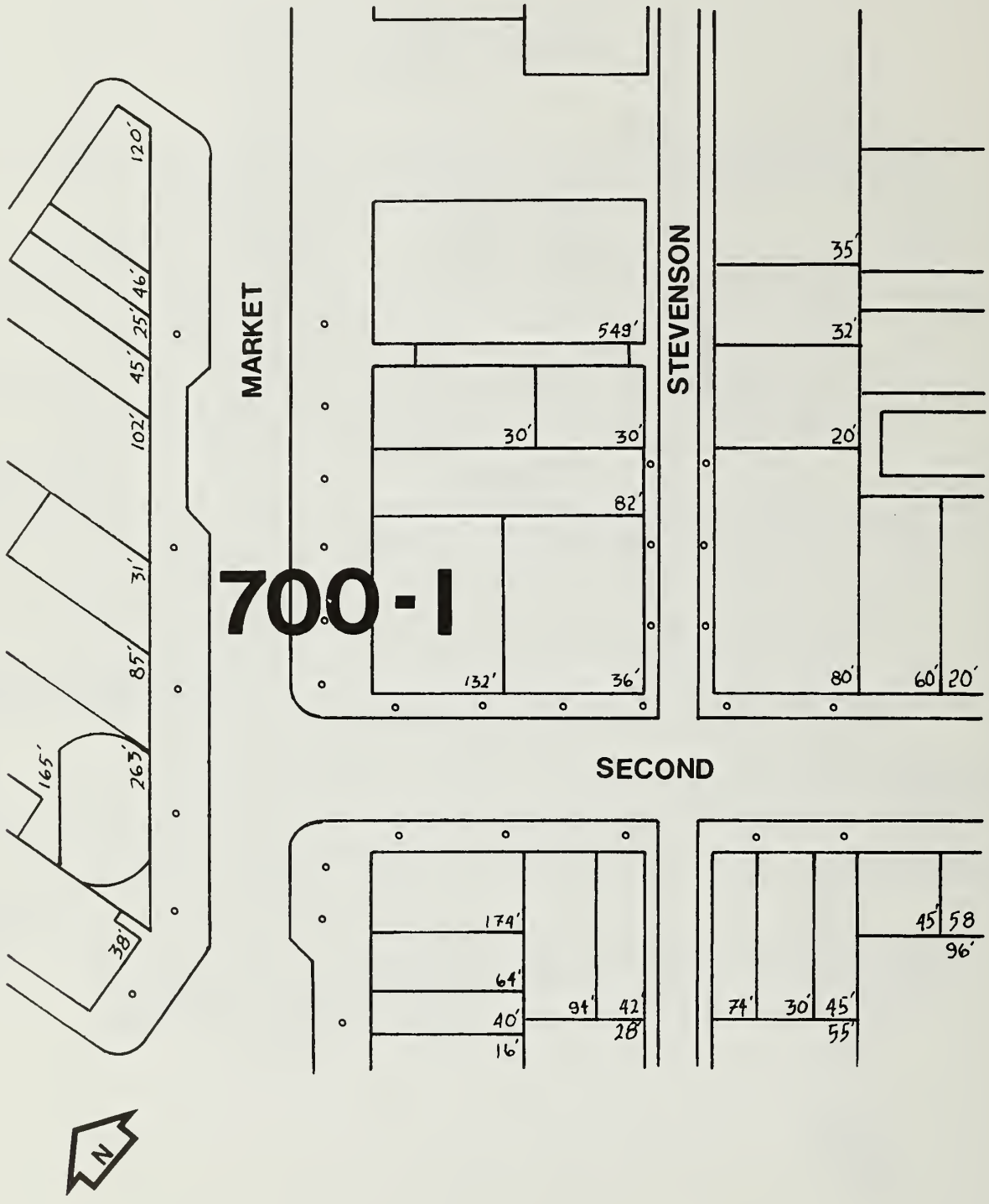
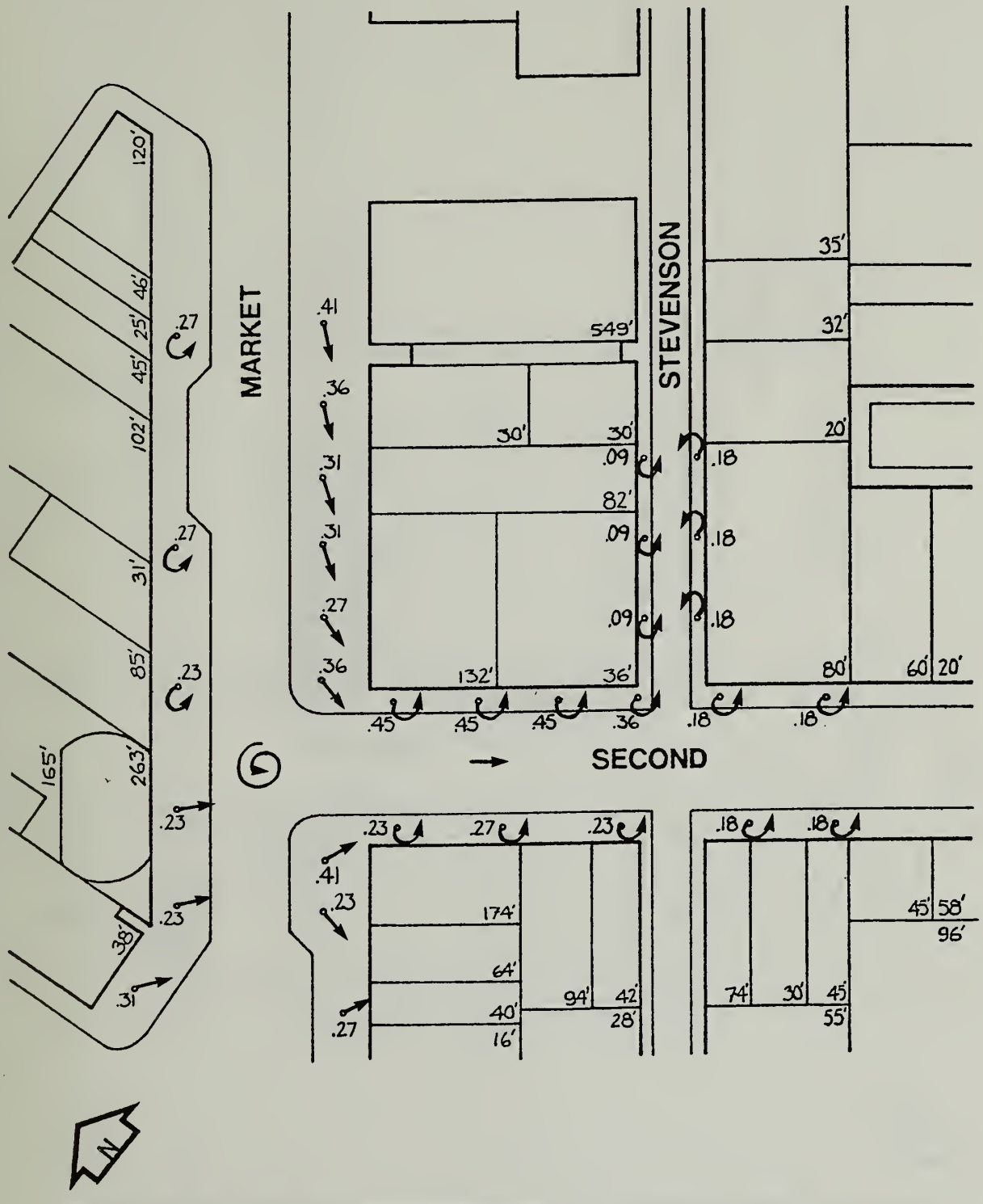


FIGURE:3 MEASURED WINDSPEEDS AND DIRECTIONS EXISTING PHASE



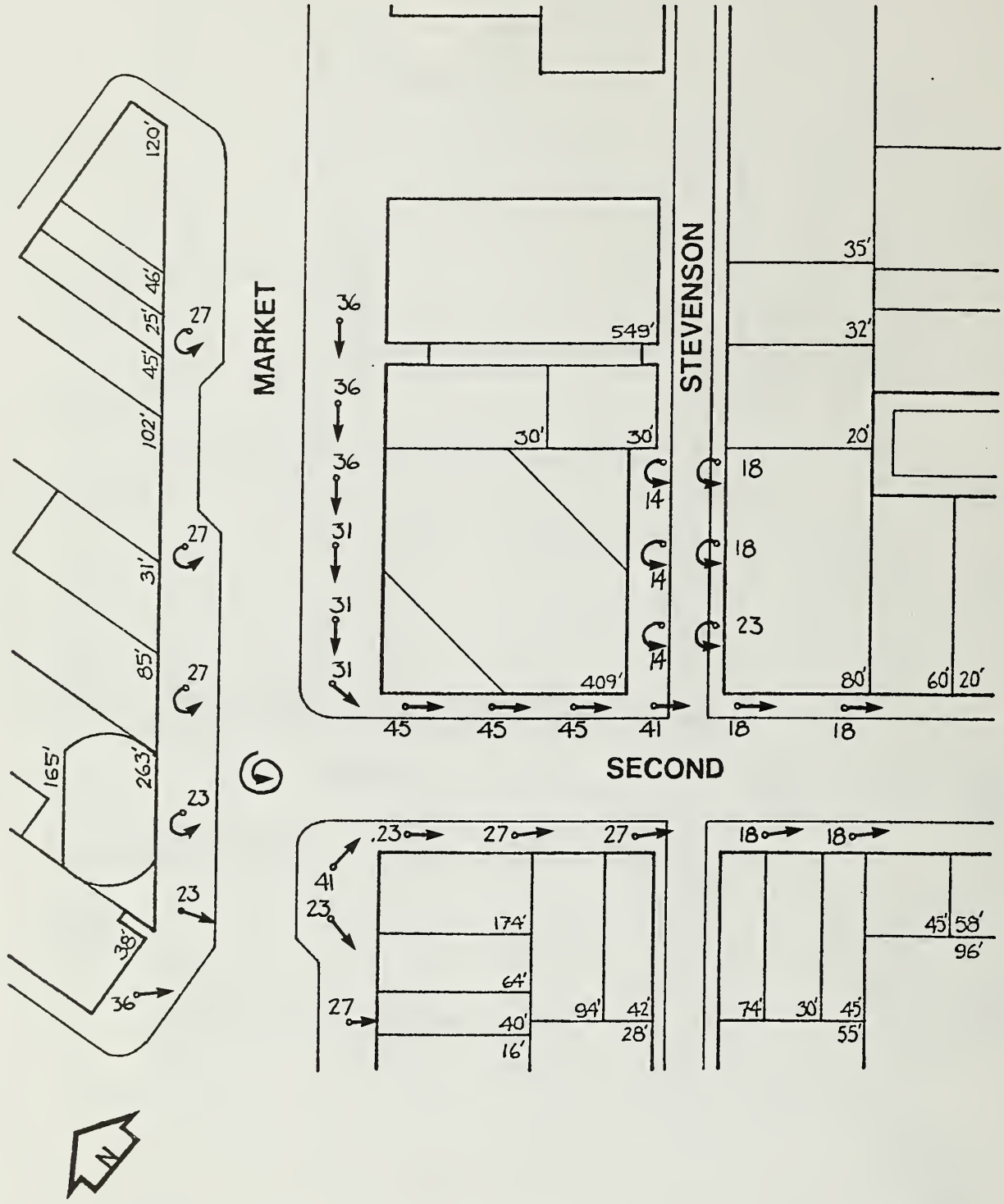
Measured windspeeds are expressed as a percentage of the calibration windspeed, which corresponds to the actual windspeed at the San Francisco Weather Station.

WIND DIRECTION: NORTHWEST

WIND SPEED OVER 50%

WIND SPEED OVER 70%

FIGURE:4 MEASURED WINDSPEEDS AND DIRECTIONS PROPOSED PHASE



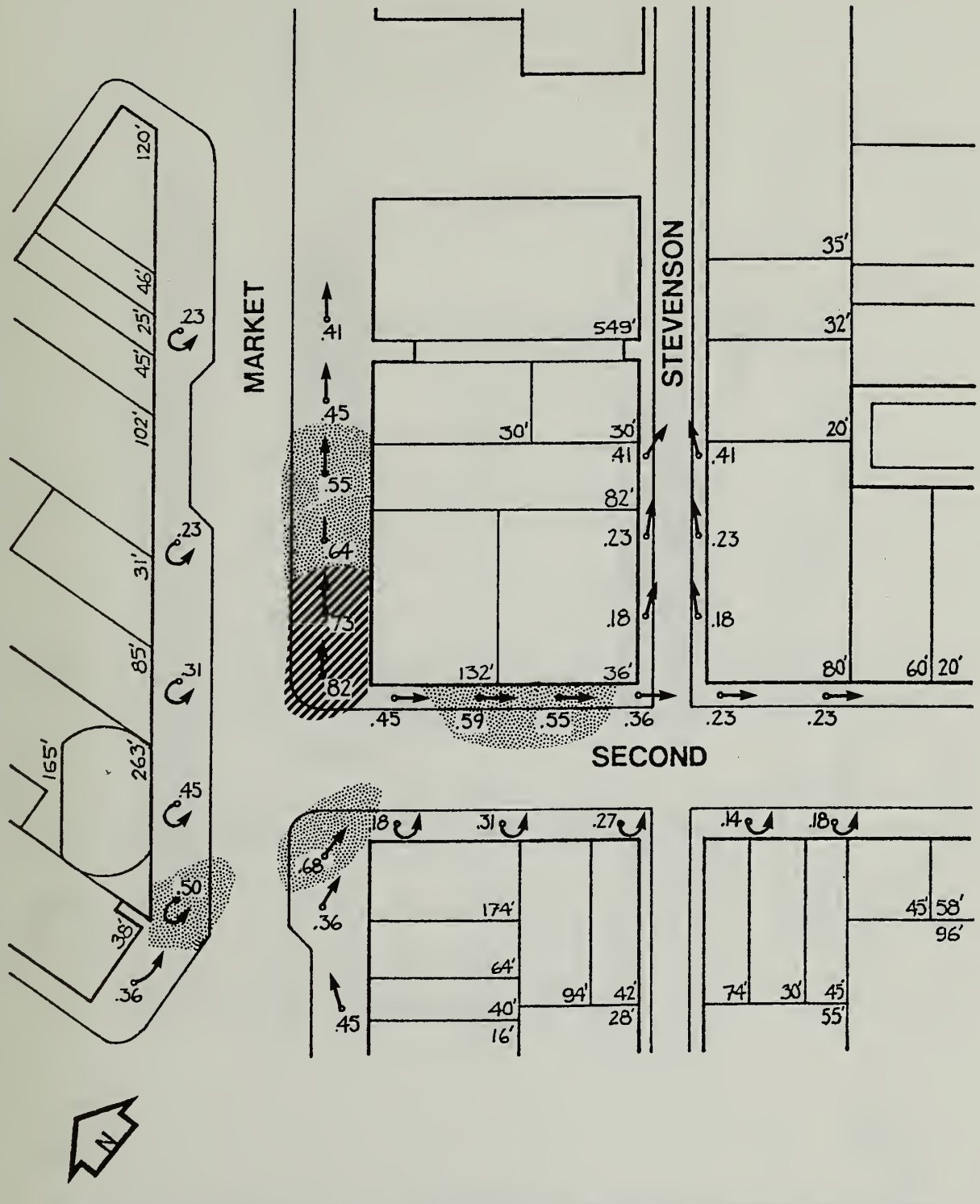
Measured windspeeds are expressed as a percentage of the calibration windspeed, which corresponds to the actual windspeed at the San Francisco Weather Station.

WIND DIRECTION: NORTHWEST

WIND SPEED OVER 50%

WIND SPEED OVER 70%

FIGURE:5 MEASURED WINDSPEEDS AND DIRECTIONS **EXISTING PHASE**

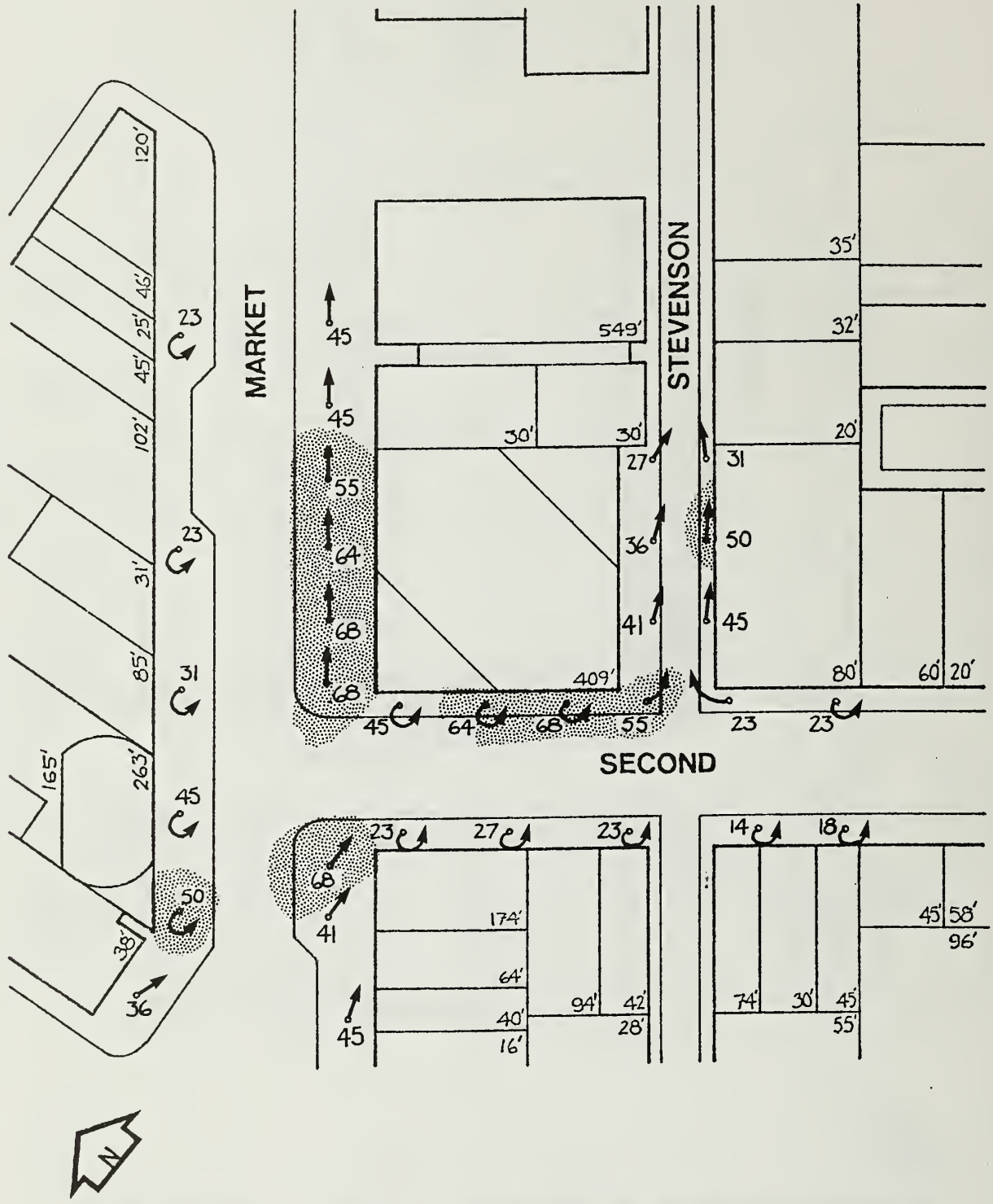


Measured windspeeds are expressed as a percentage of the calibration windspeed, which corresponds to the actual windspeed at the San Francisco Weather Station.

WIND DIRECTION: WEST

WIND SPEED OVER 50%

WIND SPEED OVER 70%



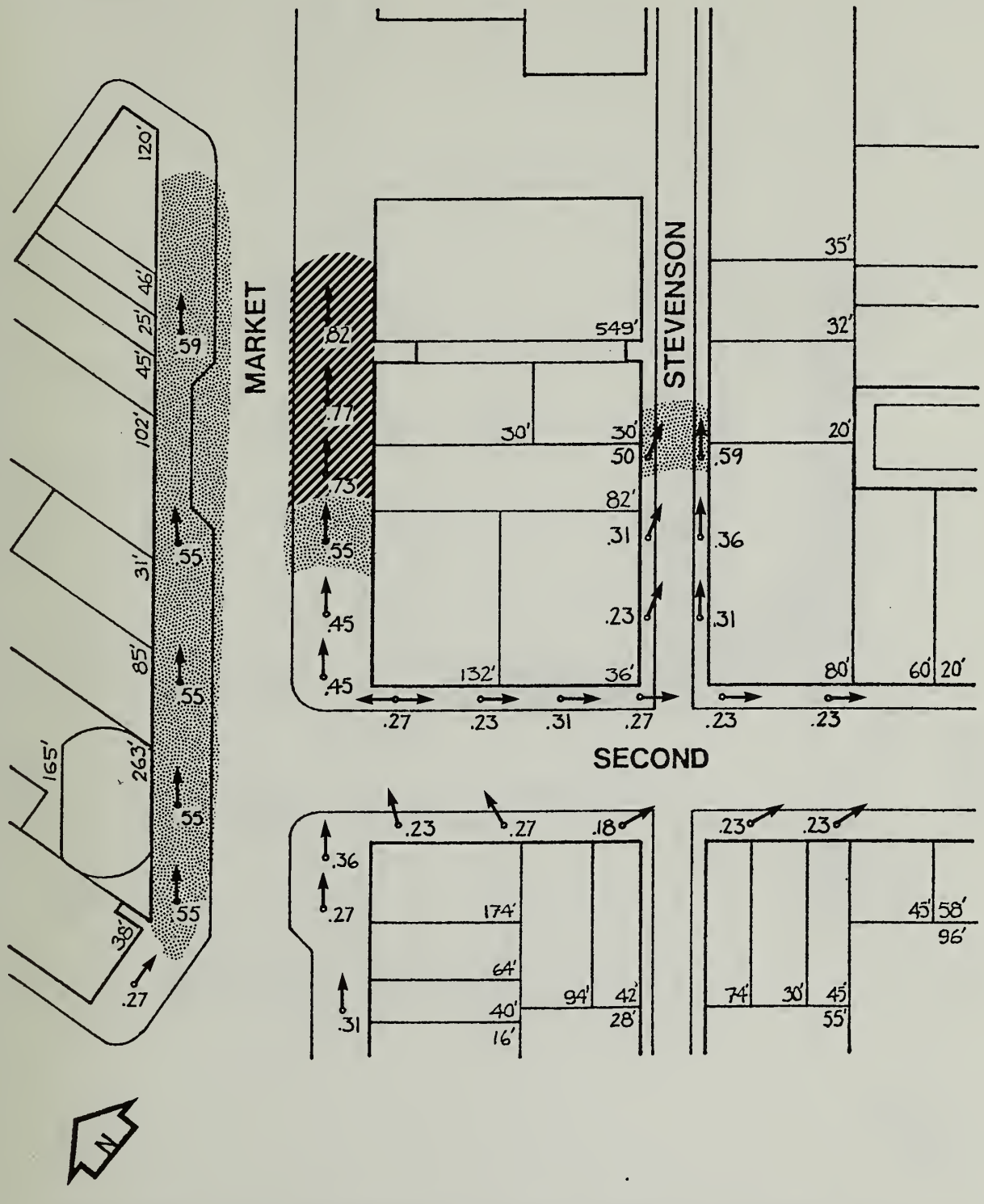
Measured windspeeds are expressed as a percentage of the calibration windspeed, which corresponds to the actual windspeed at the San Francisco Weather Station.

WIND DIRECTION: WEST

WIND SPEED OVER 50%

WIND SPEED OVER 70%

FIGURE: 7 MEASURED WINDSPEEDS AND DIRECTIONS EXISTING PHASE



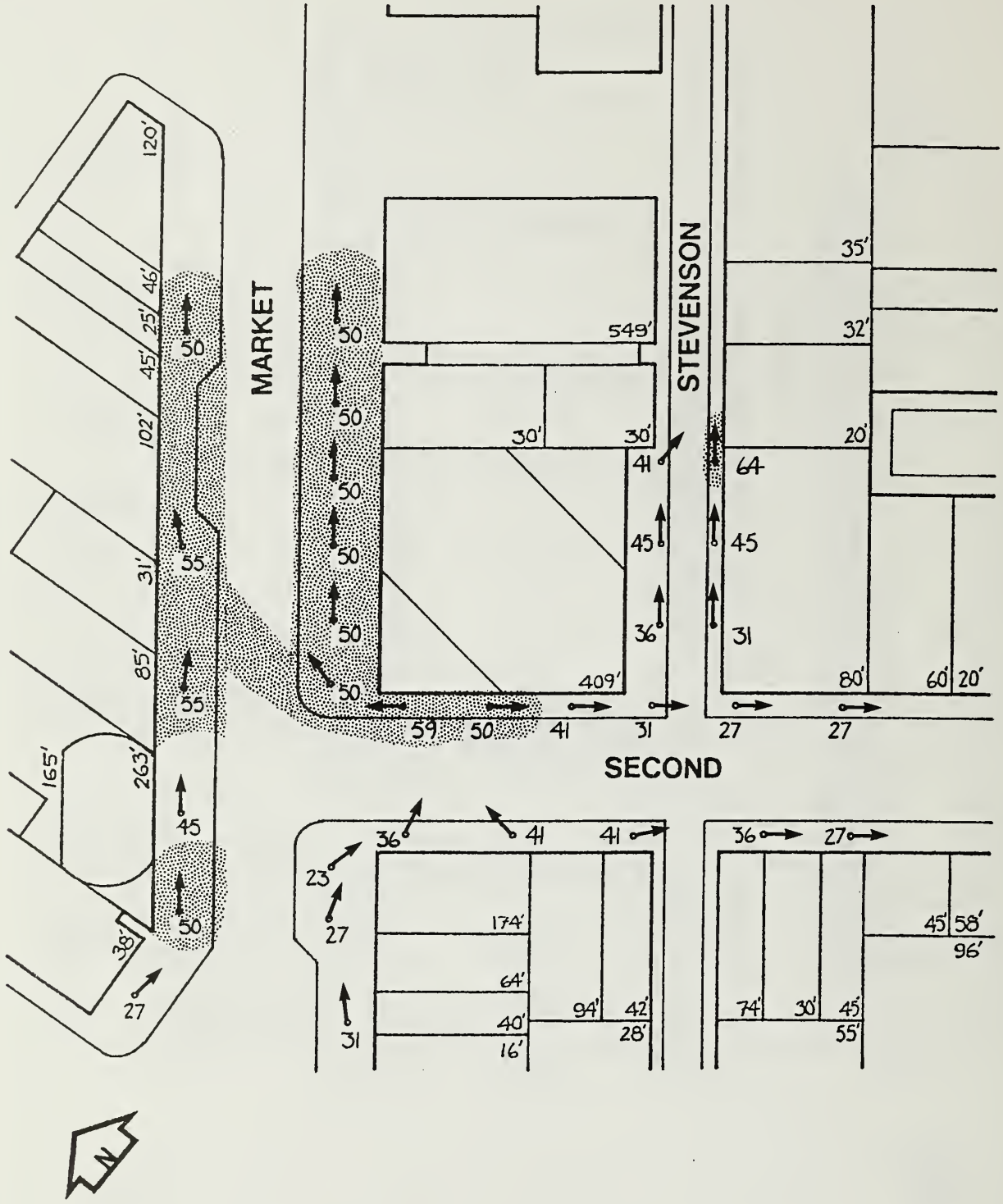
Measured windspeeds are expressed as a percentage of the calibration windspeed, which corresponds to the actual windspeed at the San Francisco Weather Station.

WIND DIRECTION: SOUTHWEST

WIND SPEED OVER 50%

WIND SPEED OVER 70%

FIGURE:8 MEASURED WINDSPEEDS AND DIRECTIONS PROPOSED PHASE



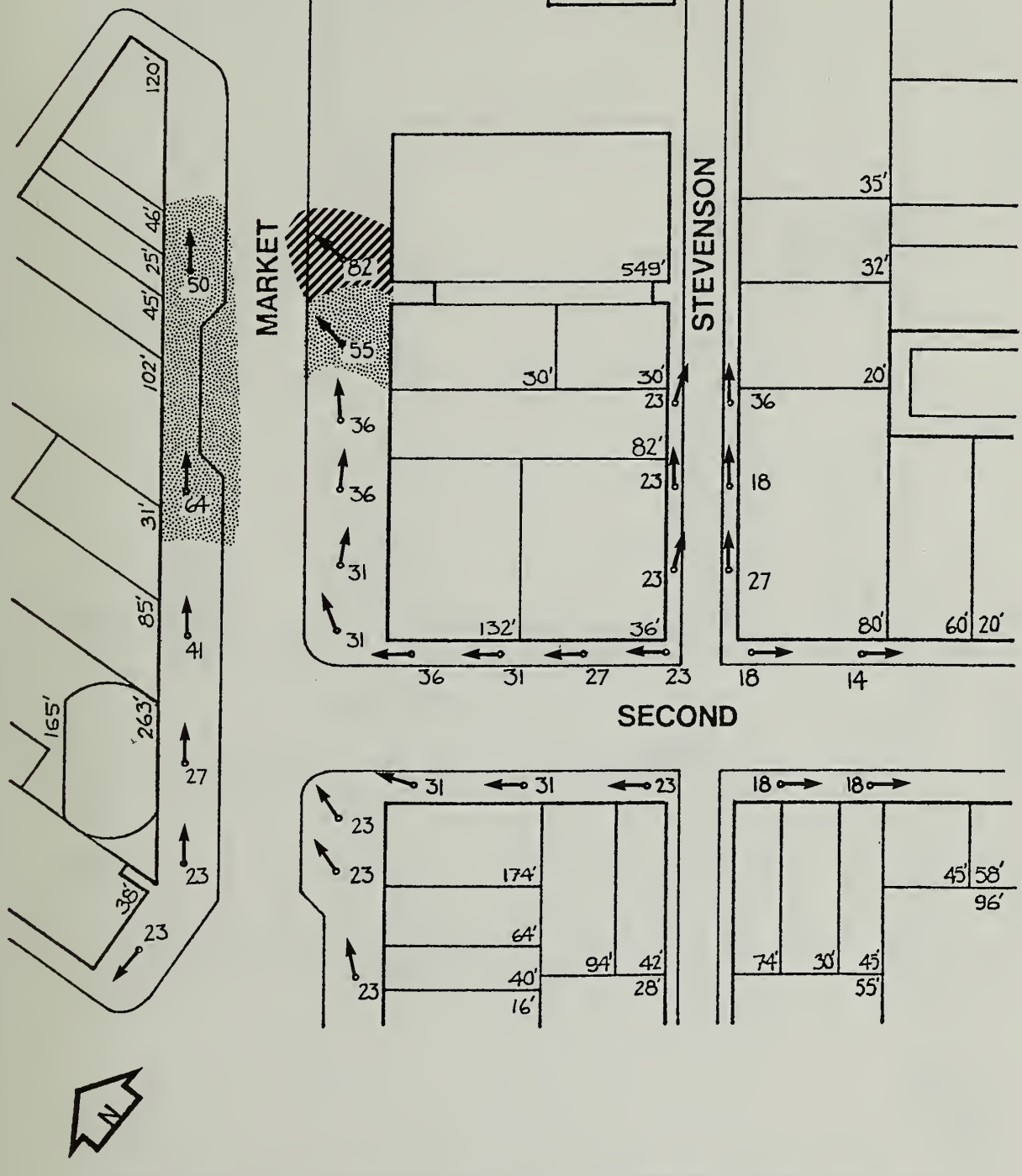
Measured windspeeds are expressed as a percentage of the calibration windspeed, which corresponds to the actual windspeed at the San Francisco Weather Station.

WIND DIRECTION: SOUTHWEST

WIND SPEED OVER 50%

WIND SPEED OVER 70%

FIGURE: 9 MEASURED WINDSPEEDS AND DIRECTIONS EXISTING PHASE



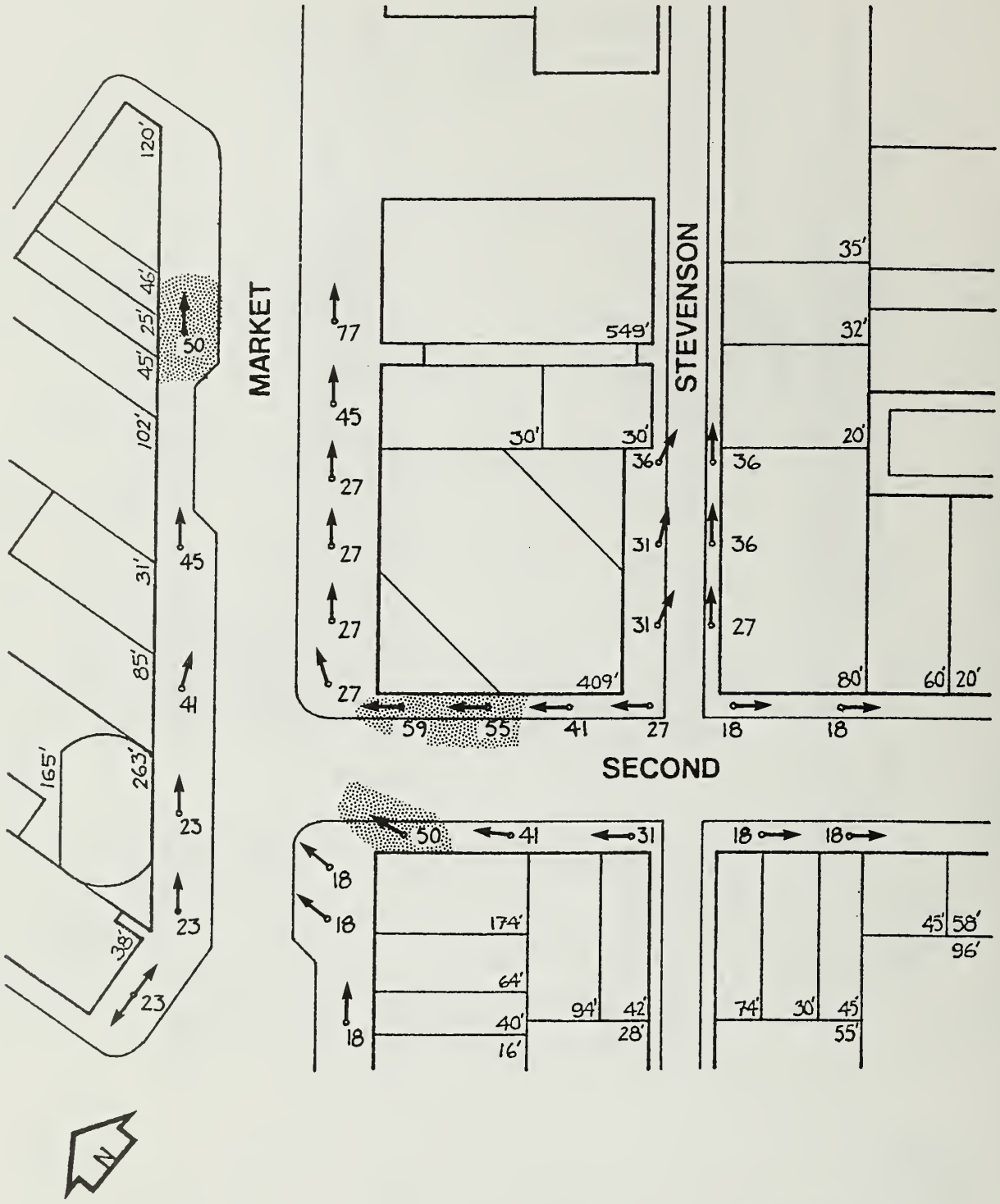
Measured windspeeds are expressed as a percentage of the calibration windspeed, which corresponds to the actual windspeed at the San Francisco Weather Station.

WIND DIRECTION: SOUTH

WIND SPEED OVER 50%

WIND SPEED OVER 70%

FIGURE:10 MEASURED WINDSPEEDS AND DIRECTIONS PROPOSED PHASE



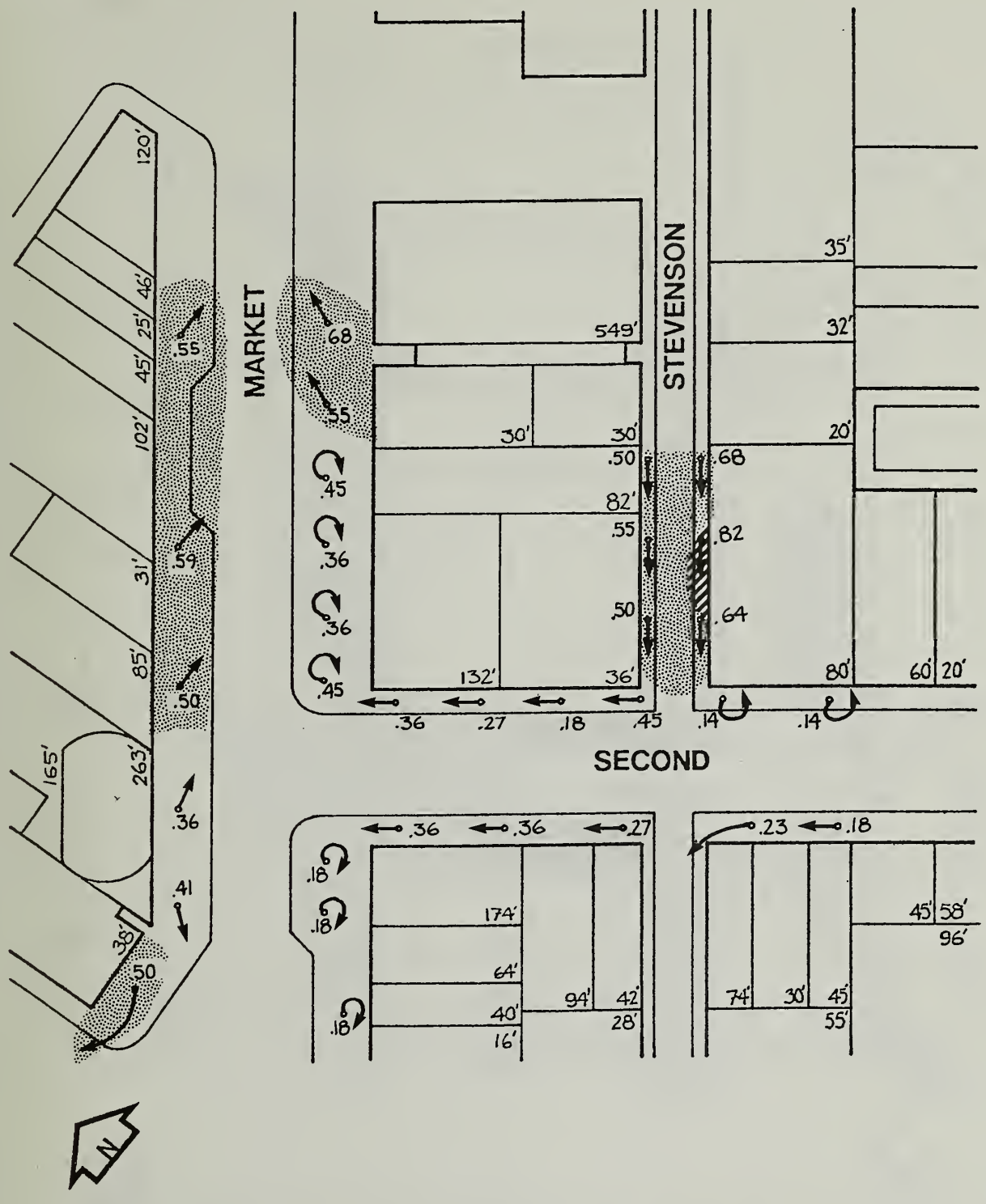
Measured windspeeds are expressed as a percentage of the calibration windspeed, which corresponds to the actual windspeed at the San Francisco Weather Station.

WIND DIRECTION: SOUTH

WIND SPEED OVER 50%

WIND SPEED OVER 70%

FIGURE: 11 MEASURED WINDSPEEDS AND DIRECTIONS **EXISTING PHASE**



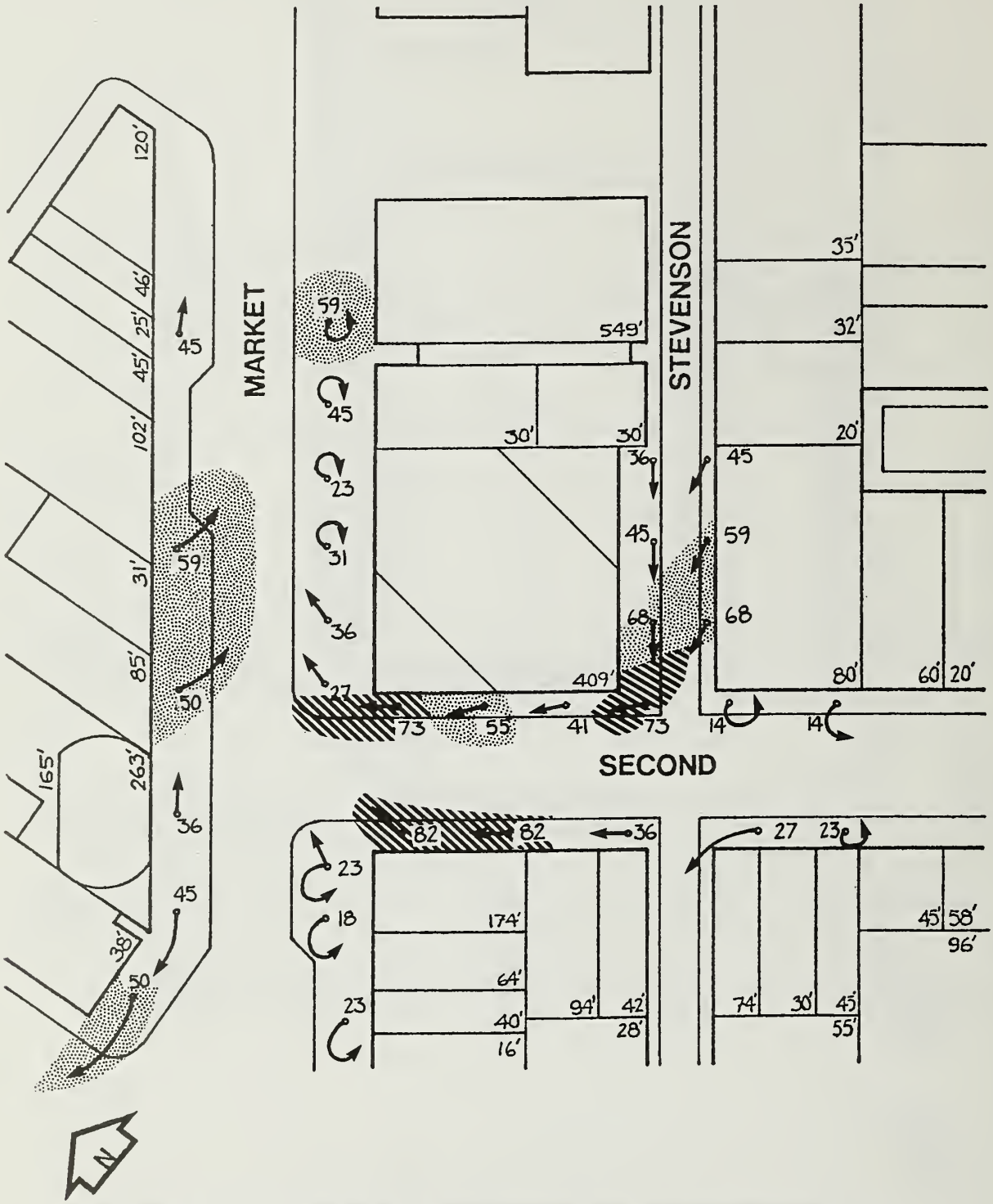
Measured windspeeds are expressed as a percentage of the calibration windspeed, which corresponds to the actual windspeed at the San Francisco Weather Station.

WIND DIRECTION: SOUTHEAST

WIND SPEED OVER 50%

WIND SPEED OVER 70%

FIGURE: 12 MEASURED WINDSPEEDS AND DIRECTIONS PROPOSED PHASE

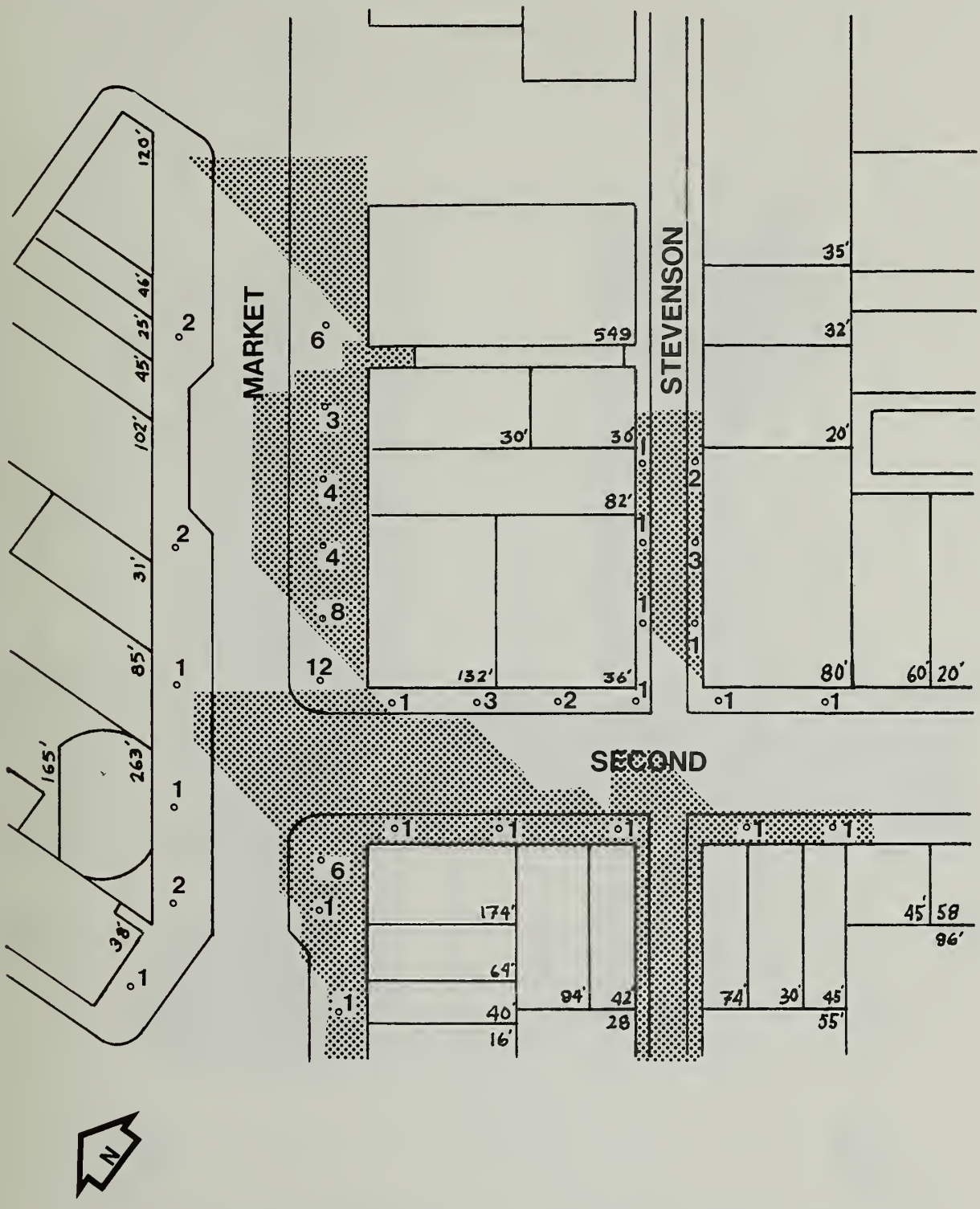


Measured windspeeds are expressed as a percentage of the calibration windspeed, which corresponds to the actual windspeed at the San Francisco Weather Station.

WIND DIRECTION: NORTHWEST

WIND SPEED OVER 50%

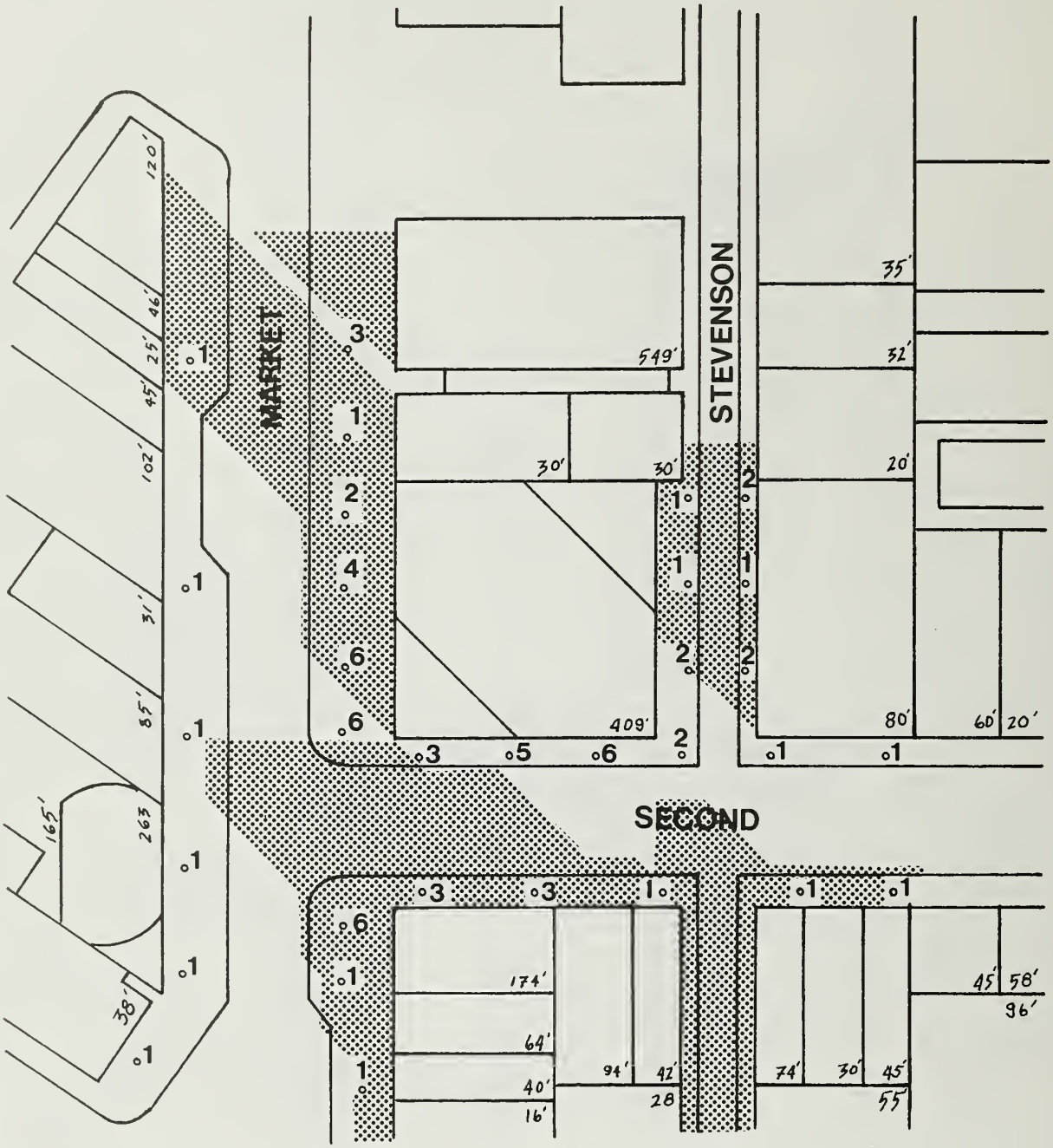
WIND SPEED OVER 70%



Frequency of discomfort as a result of physical effects is expressed as a percentage of time.

FALL: 1 PM

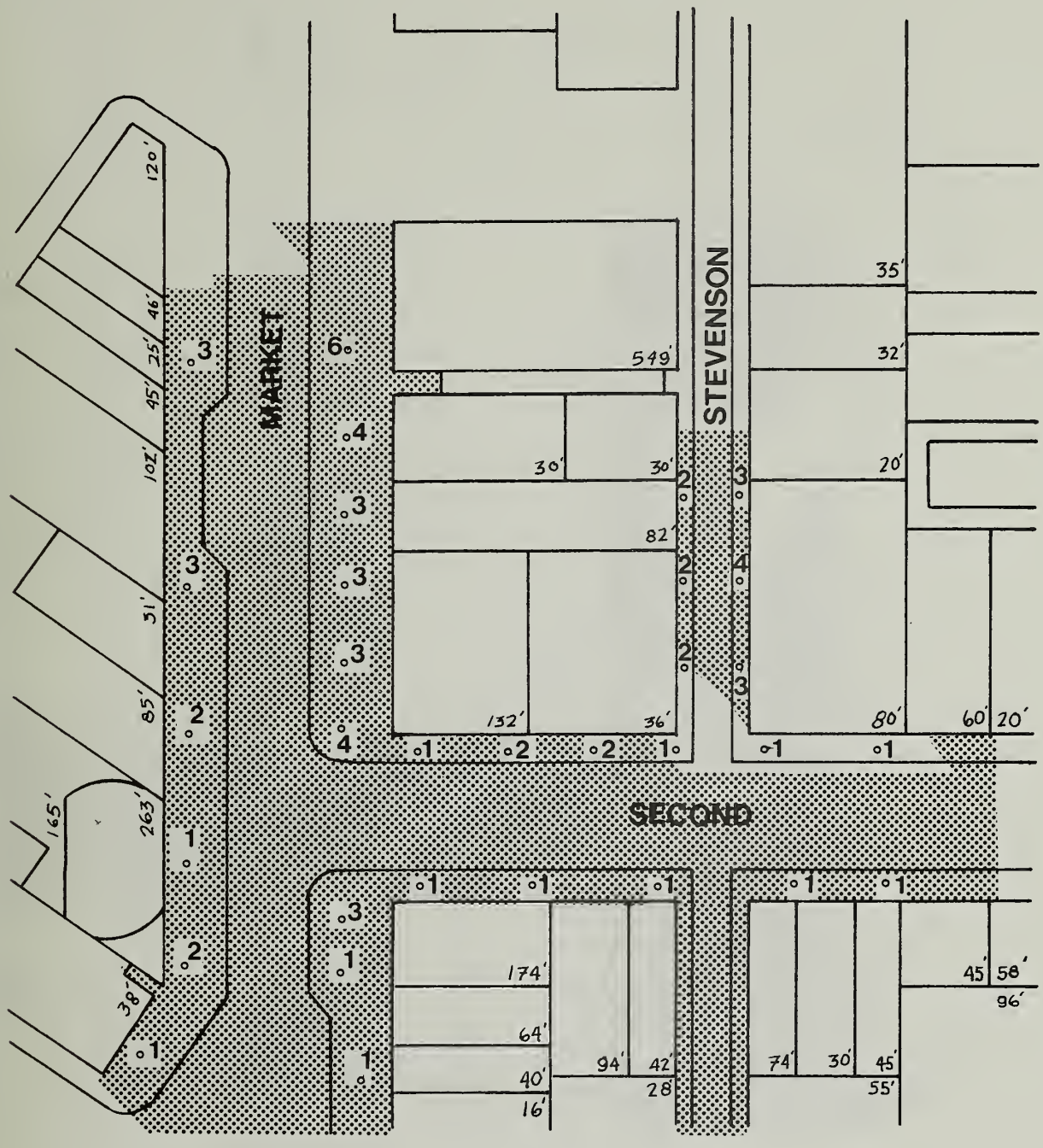
AREA OF SHADOW



Frequency of discomfort as a result of physical effects is expressed as a percentage of time.

FALL: 1 PM

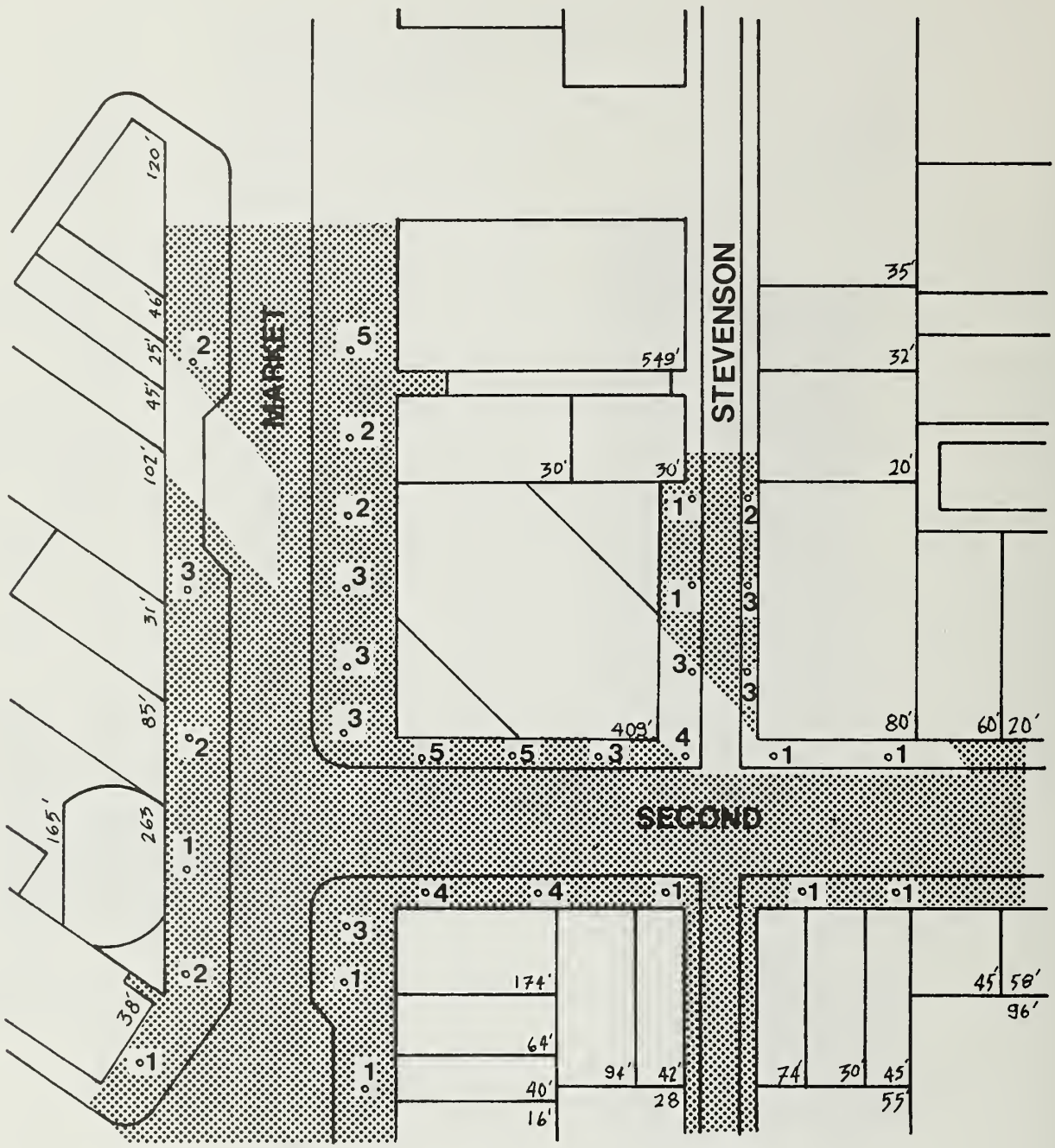
AREA OF SHADOW



Frequency of discomfort as a result of physical effects is expressed as a percentage of time.

WINTER: 1 PM

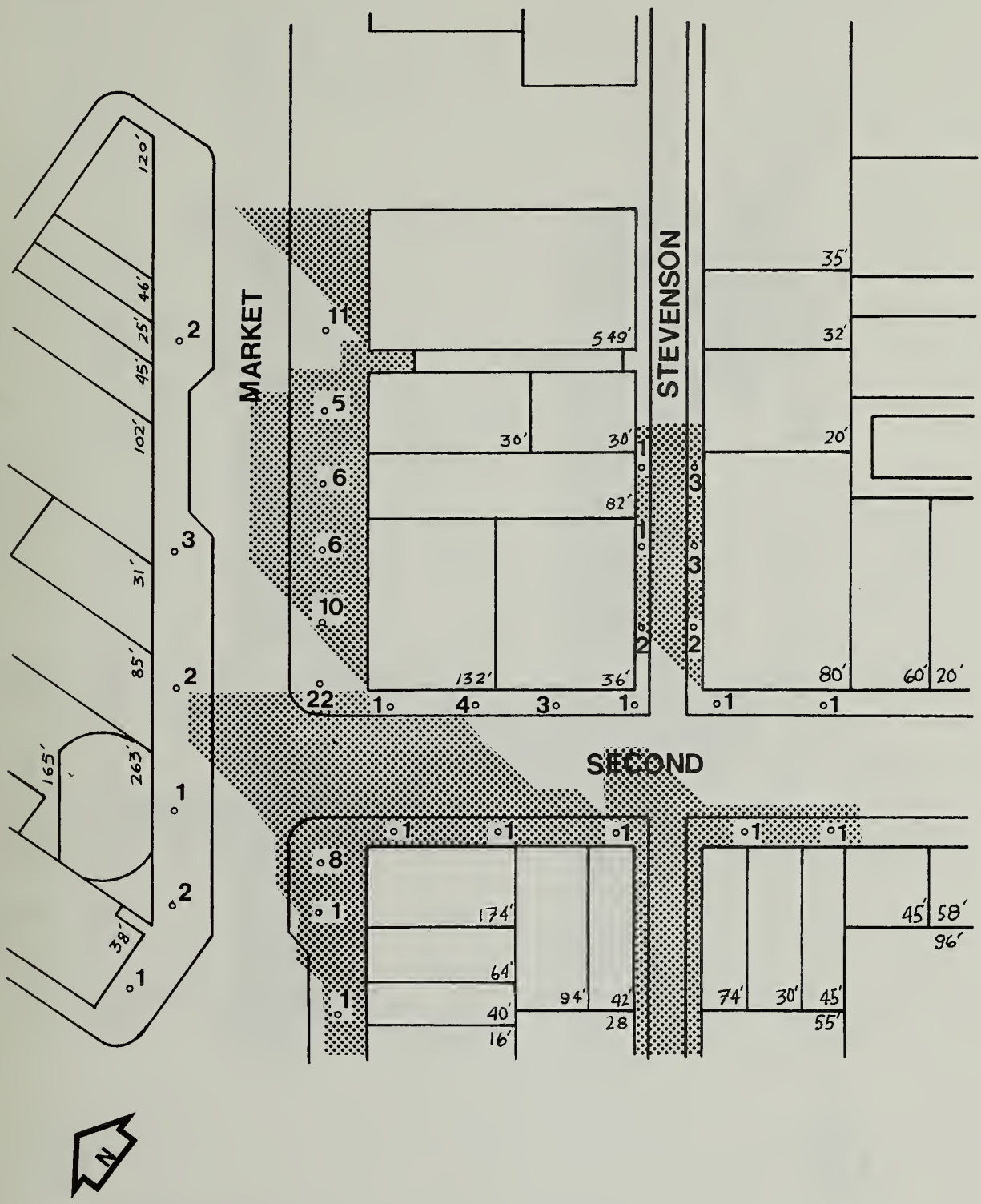
AREA OF SHADOW



Frequency of discomfort as a result of physical effects is expressed as a percentage of time.

WINTER: 1 PM

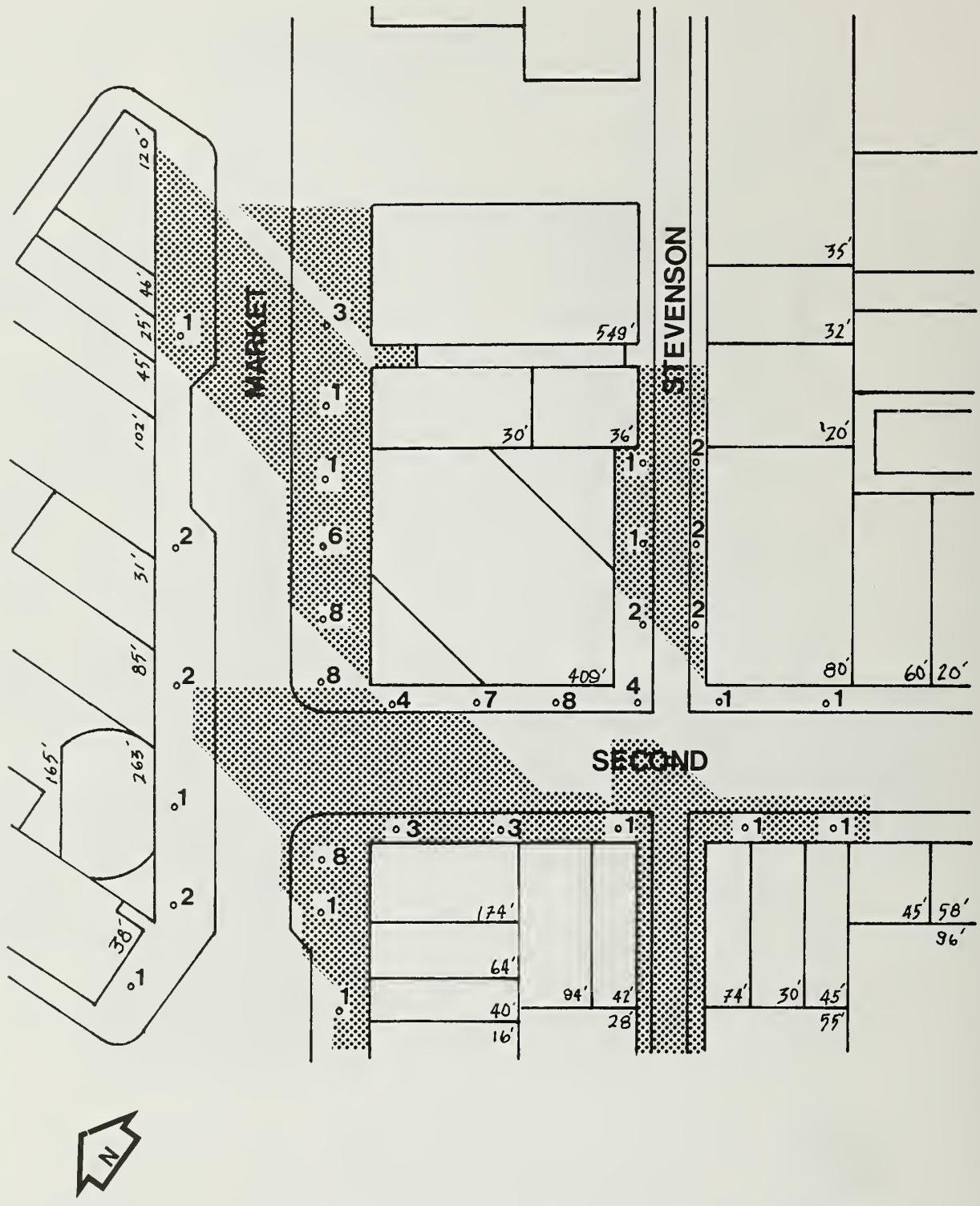
AREA OF SHADOW



Frequency of discomfort as a result of physical effects is expressed as a percentage of time.

SPRING: 1 PM

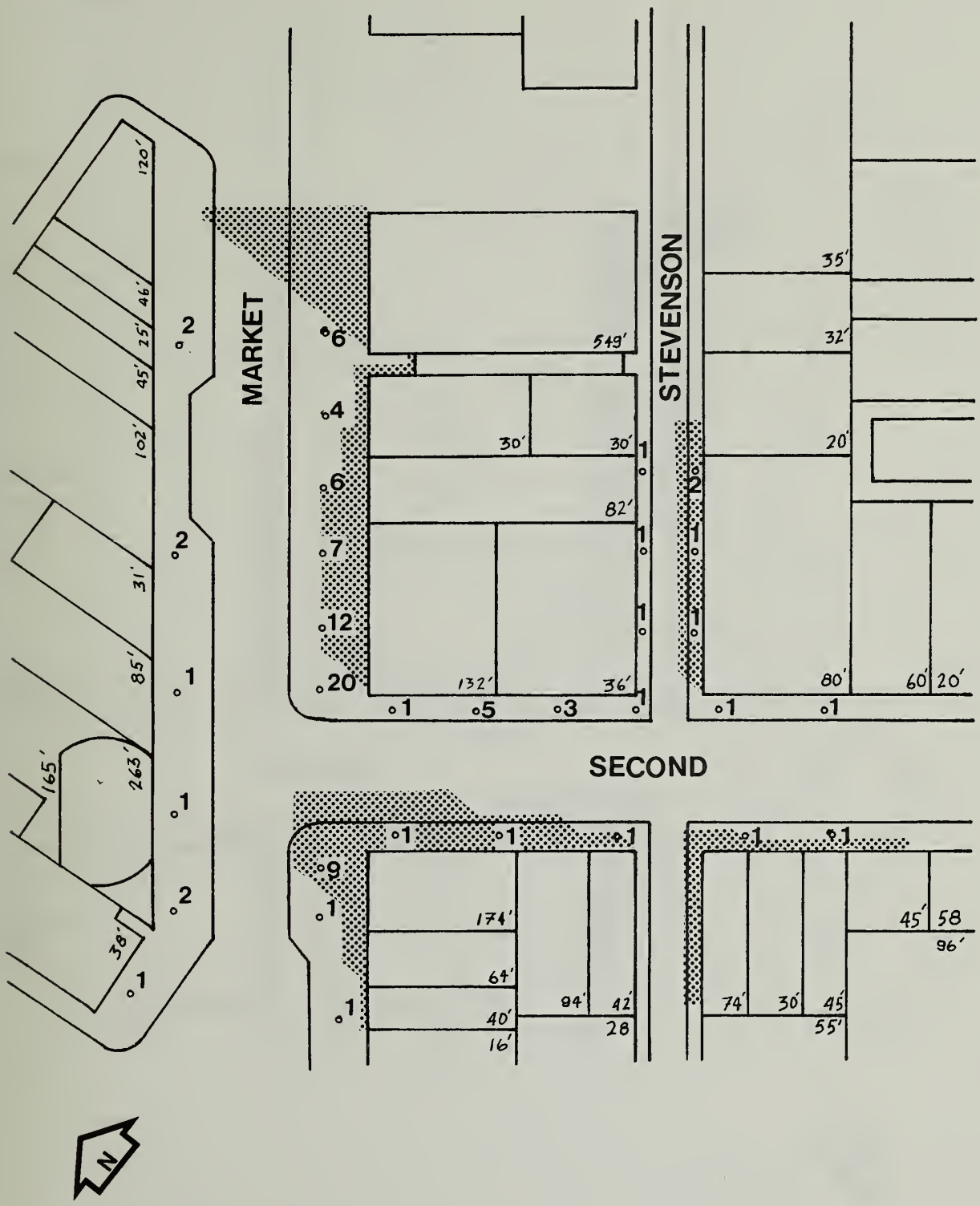
AREA OF SHADOW



Frequency of discomfort as a result of physical effects is expressed as a percentage of time.

SPRING: 1 PM

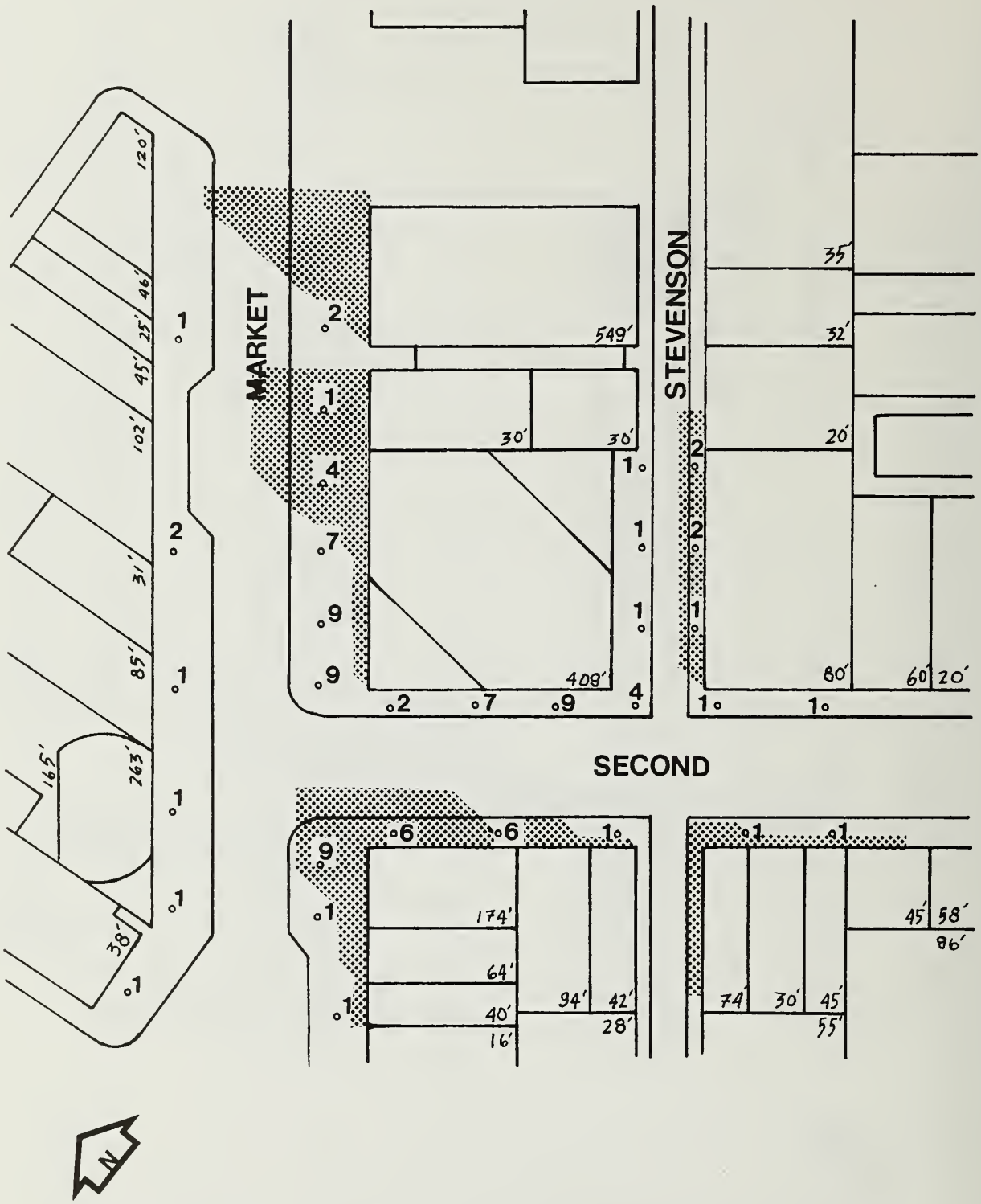
AREA OF SHADOW



Frequency of discomfort as a result of physical effects is expressed as a percentage of time.

SUMMER: 1 PM

AREA OF SHADOW



Frequency of discomfort as a result of physical effects is expressed as a percentage of time.

SUMMER: 1 PM

AREA OF SHADOW

APPENDIX B

COMMUTER TRANSPORTATION MODAL MIX STUDY

COMMUTER TRANSPORTATION MODAL MIX STUDY

This section explains what modes of transportation are likely to be used by the occupants of the building proposed at the corner of Market and Second Streets in Downtown San Francisco.

The single outstanding transportation characteristic of this site is the ready access to BART via two staircases on Market Street in front of the building.

A second important factor in modeling the movement of people to and from the site is the Muni fixed rail and bus trunk lines that service Market Street, Chart A shows the magnitude of the Muni system as a conveyance to work for the residents of San Francisco.

Extrapolating present transportation modal splits into the future is difficult and usually not very accurate. It is possible to describe the present commuter transportation modal mix (Charts A and B) and then briefly describe the changes in modal shifts that have occurred in the recent past, and those that may occur in the near future.

Chart A shows the transportation modal usage by commuters to San Francisco's Central Business District broken down by the origin of the commuter (San Francisco, Marin plus Sonoma, East Bay and Peninsula).

Chart B, "Percent of Total Commuters Arriving in San Francisco by Transportation Mode," was generated by multiplying the percentage of commuter load of a specific transportation mode for a specific sector (as displayed in Table A) by that sector's percentage of the total commuter load. Thus, Chart B shows for each mode in each sector how much of the total commuter load is carried by that mode.

The most dramatic modal shift occurred with the opening of transbay BART services September 16. As a result, Greyhound has lost approximately 4,000 of its 5,500 Eastbay commuters. They have petitioned the P.U.C. to drop all of their commuter service. "The (P.U.C.) decision also specified June 30,1975 as a date by which Greyhound may terminate all local and transbay Contra Costa County service contingent on the expansion of BART's service."[1]

The opening of transbay BART service has caused other transportation modal shifts in the transbay corridor. AC transit has deleted 70 transbay daily one-way trips since BART began transbay service.[2]

1. BART Transbay Service Effect on Bay Bridge Corridor, Presented to the State Transportation Board by Leo J. Trombatore, District 4, Caltrans December 5, 1974.

2. Ibid.

The potential for shifting commuters from one transportation mode to another by such actions as the expansion of ferry service to Marin or Federal subsidies for mass transit is beyond the scope of our Study. However it does appear that the cumulative effect of Federal Energy Conservation Policy, Federal Mass Transit Policy and Funding, the expansion of BART service and a BART feeder bus system and emphasis on mass transit by the Golden Gate Bridge, Highway and Transportation District will tend to skew these statistics in the direction of bus, BART and rail modes of transportation.

CHART A

COMMUTER USE OF TRANSPORTATION MODES

By Percentage

	MARIN[1]	PENINSULA[2]	SAN FRANCISCO[3]	EAST BAY[4]
Auto	72.5	37.0	17.0 (29)[6]	54.4
Bus	25.2		72.0 (57)	22.9
BART		63.0[5].		22.6
Ferry	2.2			
Walk			11.0 (12)	

1. Based on statistics provided by the Golden Gate Bridge, Highway and Transportation District for the moving commute of December 11, 1974.
2. Based on "Study of Impact of Intensive High Rise Development in San Francisco" by Kaiser Marsten, Kaplan and McLaughlin and David Dornbush, client SPUR and HUD, 3/75.
3. Ibid.
4. BART Transbay Service Effect on Bay Bridge Corridor, Report to State Transportation Board by L.J. Trombatore, November 7, 1974
5. This percentage includes Southern Pacific Rail Service and Greyhound.
6. Data from 1970 U.S. Census which includes persons in all categories of occupations employed in high and low-rise structures.

CHART B

PERCENTAGE OF TOTAL COMMUTERS ARRIVING IN DOWNTOWN SAN FRANCISCO[1]

	Marin/ Sonoma	Peninsula	San Francisco	East Bay	Total
Percentage of total Commuters	16 (9.4)[3]	14 (14.4)	40 (59.3)	30 (16.8)	100
Percentage by Auto	11.6	5.2	6.8	16.0	39.6
Percentage by Bus	4.0		28.8	6.8	39.6
Percentage by BART		8.8[2]		6.8	15.6
Percentage by Walking			4.4		4.4

1. Based on "Study of Impact of Intensive High Rise Development in San Francisco" by Keyser, Marsten, Kaplan and McLaughlin and David Dornbush. Client: SPUR and HUD, March, 1975.

2. Peninsula Bus Service and Southern Pacific Rail service have been included under the listing of BART because the material provided by Keyser Marsten was not disaggregated by mode.

3. Data from 1970 U.S. Census which includes persons in all categories of occupations employed in high and low-rise structures.